

NASA Contractor Report 178415, Part 2

SPACE SHUTTLE PHASE B WIND TUNNEL
MODEL AND TEST INFORMATION

VOLUME 2 - ORBITER CONFIGURATION

J. L. Glynn and D. E. Poucher

CHRYSLER CORPORATION
Military Public Electronic Systems
Michoud Engineering Office
New Orleans, Louisiana

Contract NAS1-18276
July 1988

(NASA-CR-178415-VOL-2-PT-2) SPACE SHUTTLE
PHASE B WIND TUNNEL MODEL AND TEST
INFORMATION, VOLUME 2: ORBITER CONFIGURATION
(Chrysler Corp.) 601 p

N83-27172

CSCL 01A

33/02

Unclas
0157036



National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665

* TABLE OF CONTENTS

	<u>PAGE NO.</u>
ABSTRACT	i
INDEX OF TABLES	2
INDEX OF FIGURES	3
ACRONYMS FOR TEST FACILITIES AND CONTRACTORS	8
 1.0 INTRODUCTION	 9
1.1 SPACE SHUTTLE DEVELOPMENT PHASES	9
1.2 CHRYSLER'S TEST DATABASE AND ARCHIVE SYSTEM	11
1.3 EXTRACTING PHASE B TEST DATABASE INFORMATION	13
 2.0 COMPILATION OF PHASE B DATABASE ARCHIVE CONTENTS	 14
2.1 COMPILATION OUTLINE	14
2.2 SUMMARY VOLUME	15
2.3 MODEL AND TEST INFORMATION	15
2.4 DIGITAL DATABASE	17
2.5 DIRECTORY FILE	18
2.6 GUIDE TO PHASE B DATABASE USE	20
 3.0 NOMENCLATURE AND AXIS SYSTEMS	 26
 APPENDICES	
ORBITER AERODYNAMICS	103 THROUGH 971
ORBITER AIRLOADS	972 THROUGH 979
ORBITER HEAT TRANSFER	980 THROUGH 1054

*Pages i and 1-455 published under separate cover as NASA CR-178415, Part 1.

TEST MSFC TWT50 DATA SET/RUN NUMBER
COLLATION SUMMARY

Sheet 1 of 3

☐ PRETEST
☒ POSTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										TEST RUN NUMBERS									
			α	β	δ	ε		.6	.8	.9	1.0	1.2	1.46	1.96	2.74	3.48	4.96										
R52001	B ₁ W ₁ V ₁ R ₁ M ₁	B	0	0	-40	-40	45	8	008%			005%	004%	085%	113%	130%	129%	128%									
002		C	0	0				4						194%	166%	165%	164%										
003		D	0	0				3						191%	190%	189%	189%										
004		O	E				45	8				069%	094%	104%	104%	153%	153%										
005		15						8				041%	089%	105%	138%	136%	137%										
006		30					-20	3						196%	181%		182%										
007		45					-40	2						187%			185%										
008		B	0	0	0	0	45	8	001%			003%	037%	115%	131%	132%	133%										
009								10	014%	015%	016%	017%	018%	083%	110%	120%	121%										
010							-20	10	013%	012%	011%	010%	009%	084%	111%	124%	123%										
011							-40	7				007%	008%	085%	112%	125%	125%										
012		C	0	0	0	0	45	4				064%	093%	103%	150%	151%	152%										
013		O	E					8	038%			039%	040%	085%	106%	130%	141%										
014		15						8						092%	103%	148%	147%										
015		O					0	10	065%	063%	063%	063%	092%	103%	149%	148%	147%										
016		15						10	037%	036%	035%	034%	033%	090%	107%	149%	143%										
017		B	0	0	0	0	45	2						114%		134%											
018		C	0	0	0	0		2						195%		167%											

CLM	CM	CY	CB	CA	CYN	CAB	CPC	CL	CD	IDPVAR (1)	IDPVAR (2)	IDV
7	13	19	31	37	43	49	55	61	67	75	76	

COEFFICIENTS:
α or β
SCHEDULES
A: α = -10° to +10° D: α = +35° to 50°
B: α = +5° to +25° E: β = -10° to +10°
C: α = +20° to +40° F: α = +40° to +20°

NASA-MSFC-MAF

TEST M9FC TW150 DATA SET/RUN NUMBER
COLLATION SUMMARY

Sheet 2 of 3

☐ PRETEST
☒ POSTTEST

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER		CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
			α	β	δ	ϵ	ζ		.6	.8	.9	1.0	1.2	1.46	1.96	2.74	3.48	4.96																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

CLM	CN	7	13	19	25	31	37	43	49	55	61	67	73
			CY	COL	FYN	CA	CAB	CPC	CL	CO			
IDPVAR(1) IDPVAR(2) IDV													

COEFFICIENTS:
 α or β
 SCHEDULES
 A: $\alpha = -10^\circ$ to $+10^\circ$ D: $\alpha = +35^\circ$ to $+50^\circ$
 B: $\alpha = +5^\circ$ to $+25^\circ$ E: $\beta = -10^\circ$ to $+10^\circ$
 C: $\alpha = +20^\circ$ to $+40^\circ$ F: $\alpha = +40^\circ$ to $+20^\circ$

NASA-MSPC-MAF

DELTA WING ORBITER
MSC
DR#1186 B-1- 355

TEST M9FC TWT 510 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES					NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		a	b	5	6	7	8	9		.6	.8	.9	1.0	1.2	1.46	1.96	2.74	3.48	4.96	R ² /I																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
R52039	B ₁ W ₁ V ₁ R ₁ M ₁	B	O	O	O	O	O	O	1	018%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

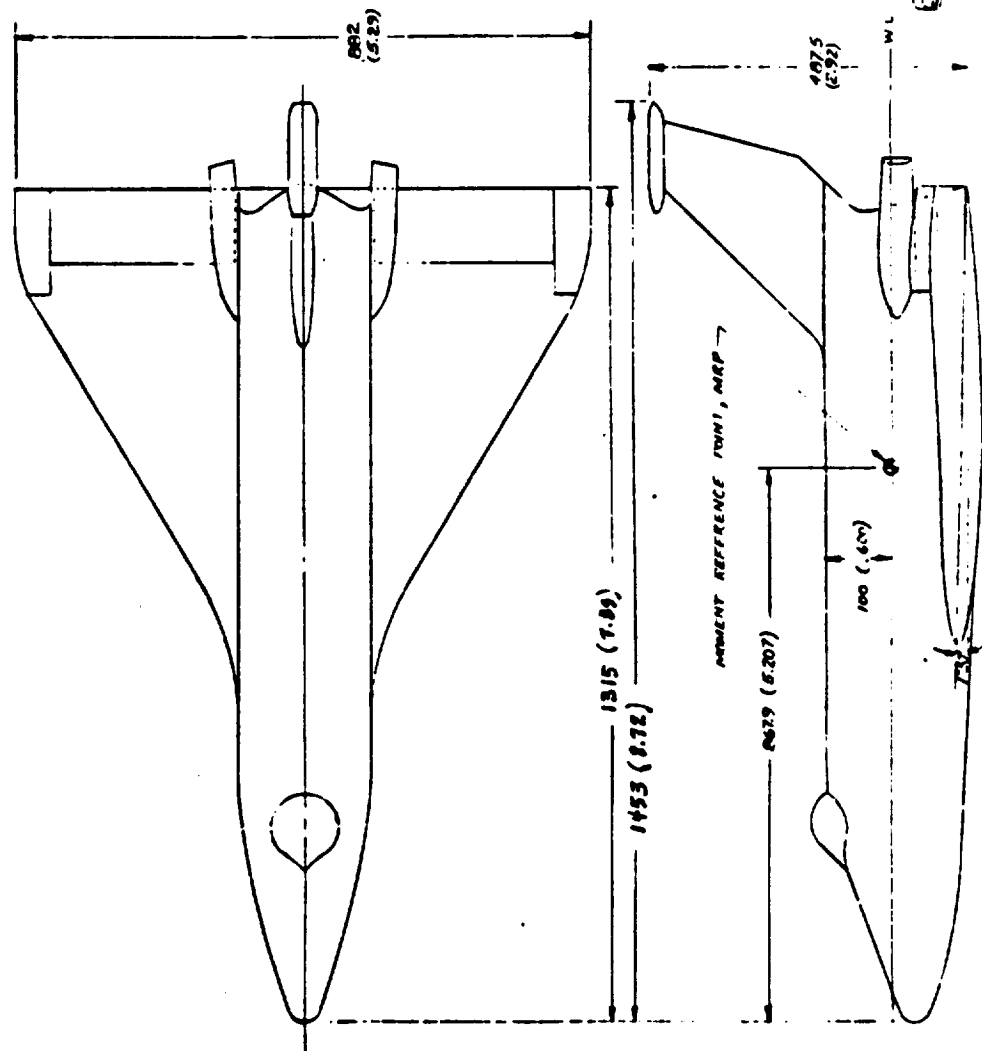
COEFFICIENTS:
a or b
SCHEDULES
A: $\alpha = -10^\circ$ to $+10^\circ$
B: $\alpha = +5^\circ$ to $+25^\circ$
C: $\alpha = +20^\circ$ to $+40^\circ$
D: $\alpha = +36^\circ$ to $+50^\circ$
E: $\beta = -10^\circ$ to $+10^\circ$
F: $\alpha = +40^\circ$ to $+20^\circ$

NASA-M9FC-MAP

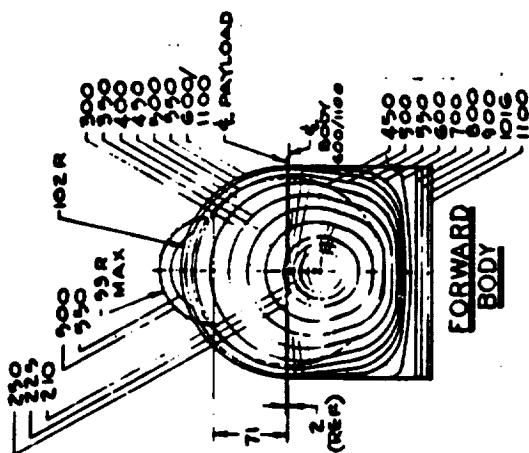
GENERAL ARRANGEMENT, 040A ORBITER

ORIGINAL PAGE IS
OF POOR QUALITY

- NOTES:
1. ALL DIMENSIONS ARE IN INCHES
2. MODEL VALUES ARE SHOWN IN PARENTHESES



ORBITER BODY ~ BI, BIA



- NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
 2. MODEL VALUES ARE SHOWN IN PARENTHESES.
 3. DASHED LINE REPRESENTS BIA CONFIGURATION, (BI 1/6 canopy, CI)

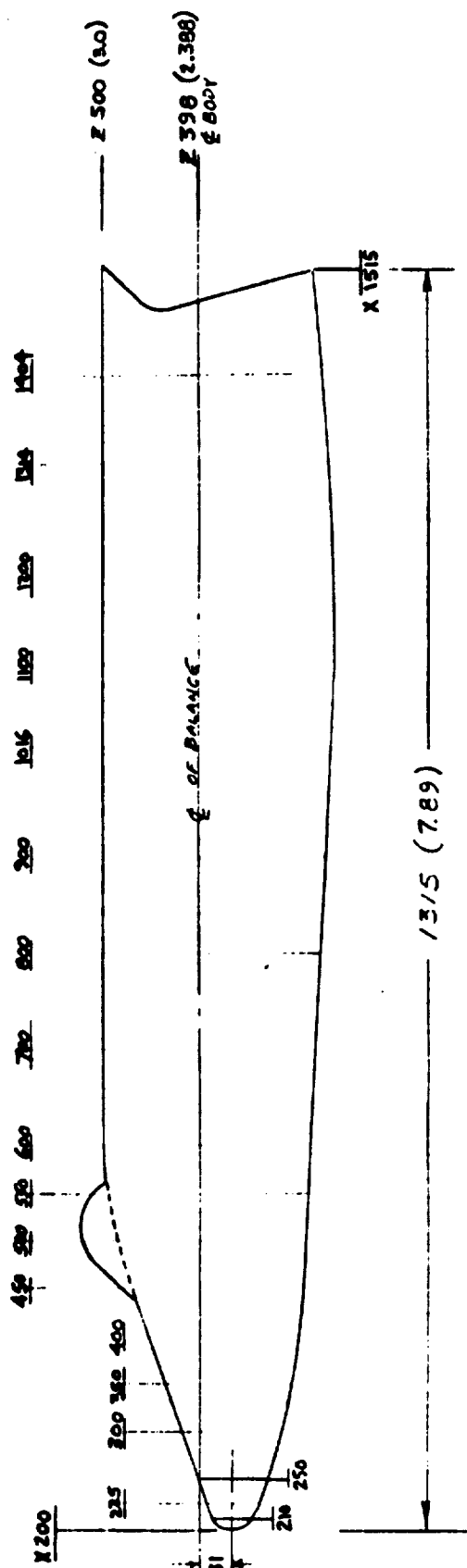
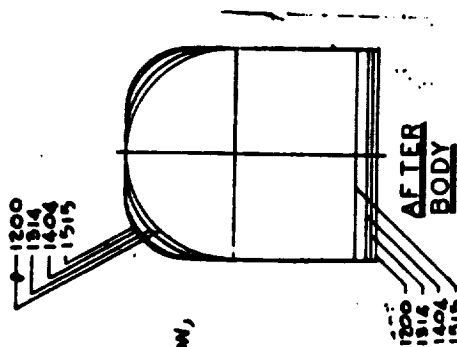
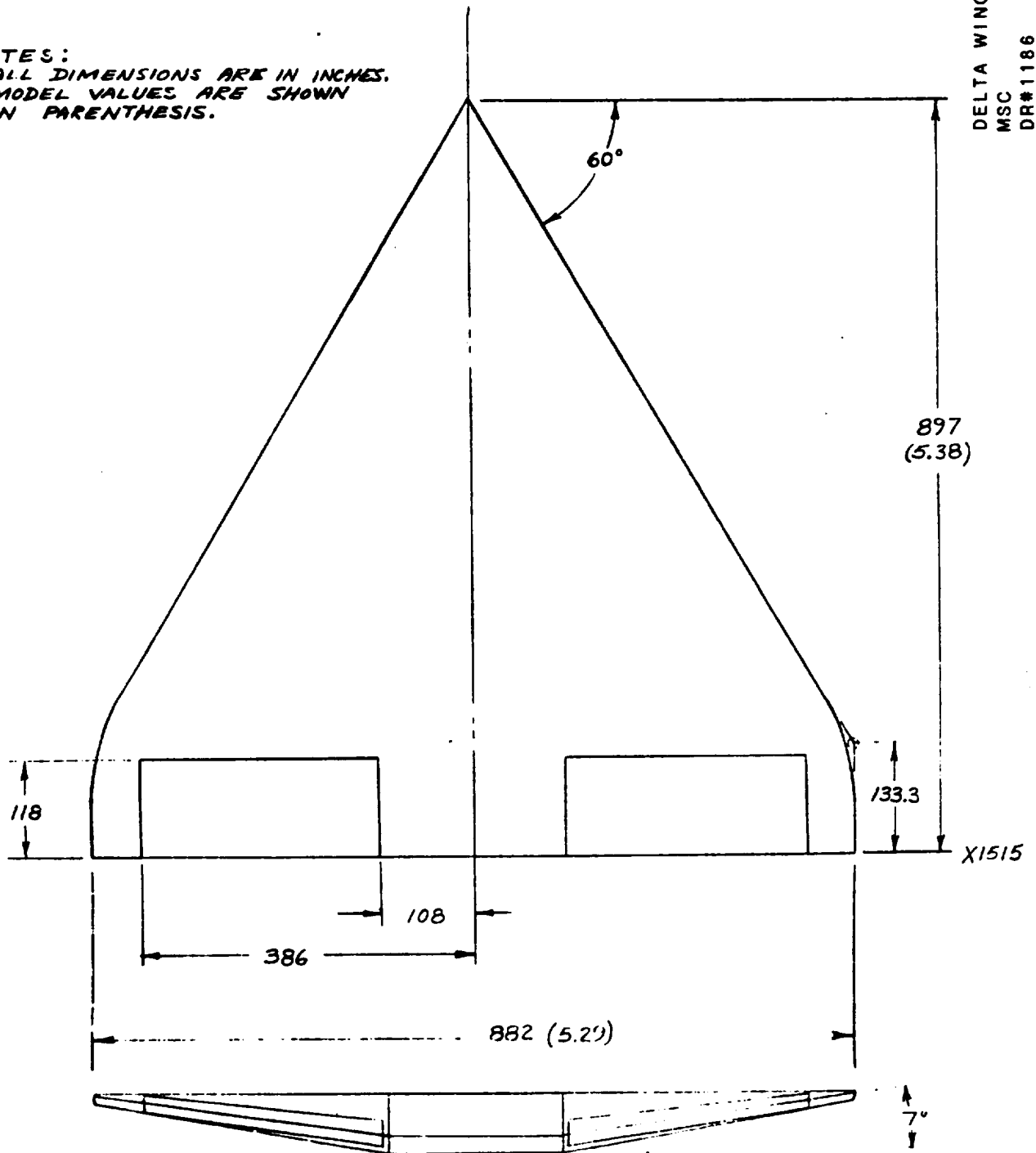


FIGURE 4.

ORIGINAL PAGE IS
OF POOR QUALITY

WING AND ELEVON ~ W1

NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN
IN PARENTHESIS.



NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN IN PARENTHESES.
3. DASHED LINE REPRESENTS VIA; (VI LESS ACPS
ENGINE POD)

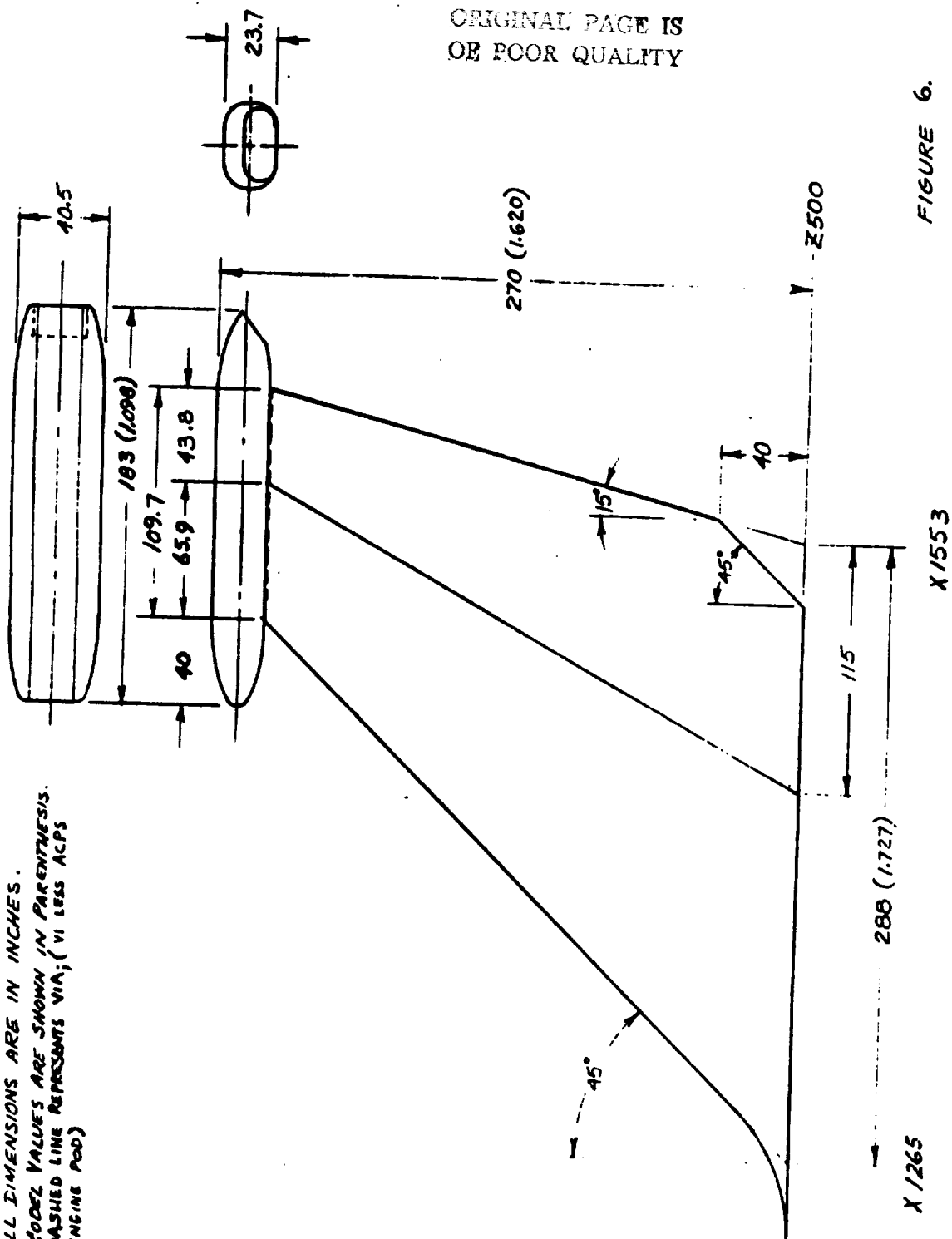
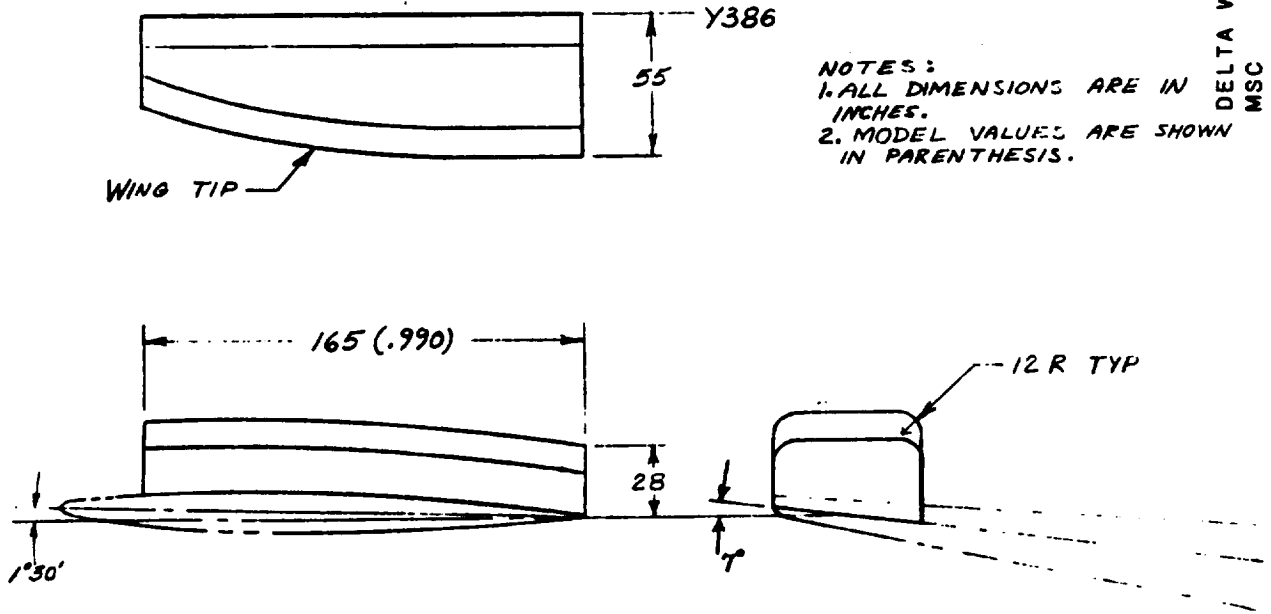


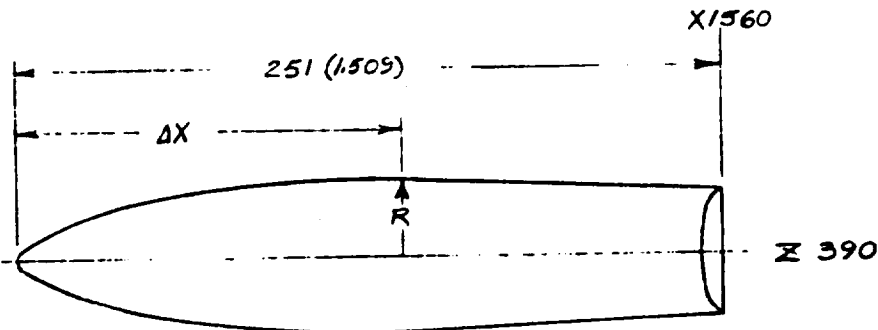
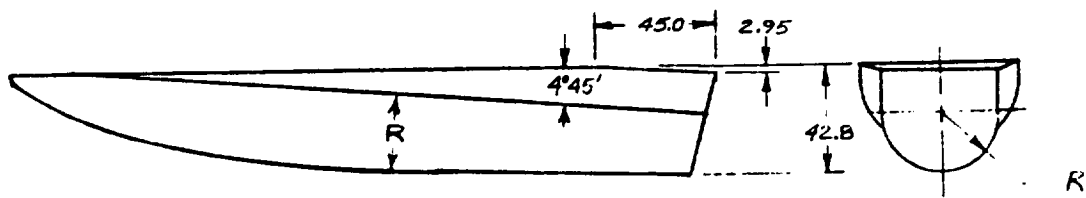
FIGURE 6.

ORIGINAL PAGE IS
OF POOR QUALITY

ACPS ENGINE POD ~ PL



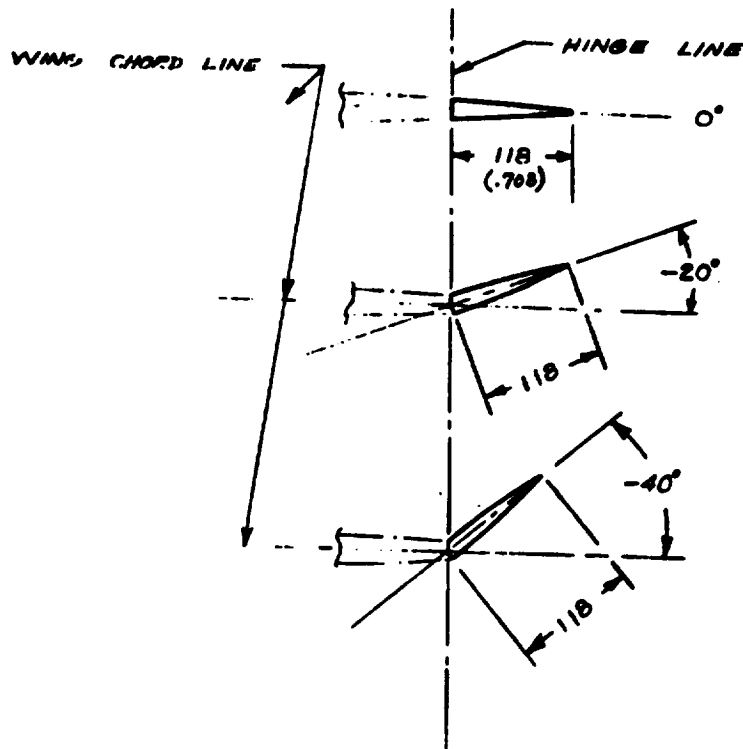
OMS ENGINE POD ~ M1



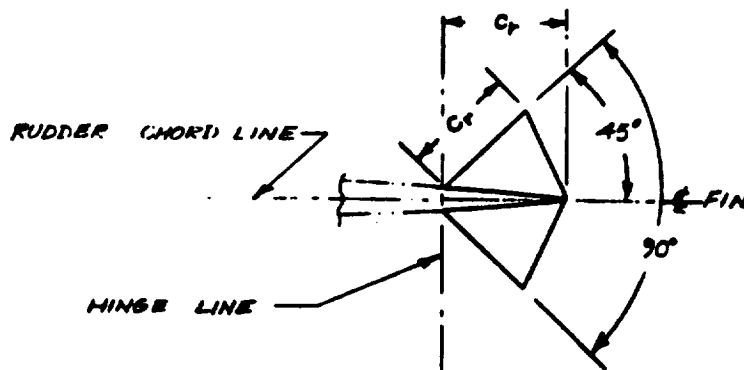
4X	R
0	0
25.0	15.0
58.3	23.7
75.0	28.0
100.0	29.5
133.0	29.2
245.0	24.0

ORIGINAL PAGE IS
OF POOR QUALITY

ELEVON DEFLECTIONS



45° RUDDER FLARE AT A TYPICAL SECTION

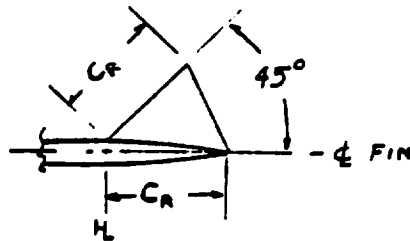


- NOTES:
 1. DIMENSIONS ARE IN INCHES
 2. C_r IS RUDDER LOCAL CHORD.
 3. MODEL VALUES SHOWN IN PARENTHESES

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER
MSC
DR#1186 B-1-363

45° RIGHT RUDDER FLARE AT A TYPICAL SECTION



NOTE : • C_R = LOCAL RUDDER CHORD

20° RUDDER FLARE AT A TYPICAL SECTION

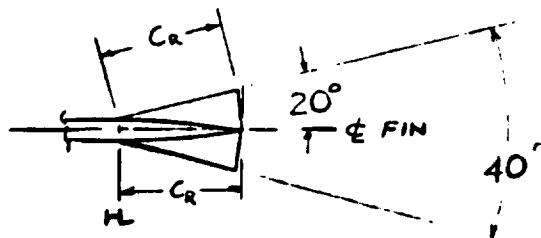


TABLE 1
TEST 66-605 DATA SET/RUN NUMBER
COLLATION SUMMARY

ORIGINAL PAGE IS
OF POOR QUALITY

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES						NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)					TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
		a	b	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16	17	18	19	20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
0001	B.C.D.M.P.V.W.	A	0	0	0	0	0	0	5						5	4	3	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</

CL CUM CD CA CN CY CBL CYN CAB L/D MACH ALPHA

COEFFICIENTS: $C_L(A) = -1, 0, 2, 4, 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 29$

a or b $C_L(A) = -1, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 29$

SCHEDULES $X(B) = -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18$

NASA-SPC-241

TABLE 1 - Continued

TEST 66-605 DATA SET/RUN NUMBER

COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. a	SCHD. b	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)								TEST RUN NUMBERS									
				1	2	3	4		0.6	0.9	1.2	1.5	2.0													
RBE 021	B.C.D.M.P.V.W.	B	5	0	0	0	0	5	105	104	103	102	101													
022	B.C.D.M.P.V.W.								110	109	108	107	106													
023	B.C.D.M.P.V.W.								115	114	113	112	111													
024	B.C.D.M.P.V.W.								120	119	118	117	116													
025	B.C.D.M.P.V.W.								125	124	123	122	121													
026	B.C.D.M.P.V.W.								130	129	128	127	126													
027	B.C.D.M.P.V.W.								135	134	133	132	131													
028	B.C.D.M.P.V.W.								140	139	138	137	136													
029	B.C.D.M.P.V.W.								143	142	141	140	139													
030	B.C.D.M.P.V.W.								148	147	146	145	144													
031	B.C.D.M.P.V.W.								153	152	151	150	149													
032	B.C.D.M.P.V.W.								158	157	156	155	154													
033	B.C.D.M.P.V.W.								163	162	161	160	159													
034	B.C.D.M.P.V.W.								168	167	166	165	164													
035	B.C.D.M.P.V.W.								173	172	171	170	169													
036	B.C.D.M.P.V.W.								178	177	176	175	174													
037	B.C.D.M.P.V.W.								183	182	181	180	179													
038	B.C.D.M.P.V.W.								188	187	186	185	184													
039	B.C.D.M.P.V.W.								218	217	216	215	214													
040	B.C.D.M.P.V.W.								223	222	221	220	219													

COEFFICIENTS: $\Delta(A_2)$ AT $H=12, 0.9, 0.6, 0.4, 0.3, 0.2, 0.1, 0.0$
 a or b $14, 16, 18, 20, 0$
 SCHEDULES $\Delta(C) = -5, -4, -3, -2, -1, 0, +1, 2, 3, 4, 5, 6, 8, 10, 0$

NASA-MSFC-44P

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES						NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						TEST RUN NUMBERS									
		a	b	1	2	3	4	5	6																	
041	B.C.D.M.P.V.W.	1	0	0	0	0	0	0	0	5	0.6	0.9	1.2	1.5	2.0		20									
042	B.C.D.M.P.V.W.										2.28	2.27	2.26	2.25	2.24											
043	B.C.D.M.P.V.W.										2.32	2.32	2.31	2.30	2.29											
044	B.C.D.M.P.V.W.										2.32	2.32	2.36	2.35	2.34											
045	B.C.D.M.P.V.W.										1.98	1.97	1.96	1.95	1.94											
046	B.C.D.M.P.V.W.										2.08	2.07	2.06	2.05	2.04											
047	B.C.D.M.P.V.W.										2.58	2.57	2.56	2.55	2.54											
048	B.C.D.M.P.V.W.										2.63	2.62	2.61	2.60	2.59											
049	B.C.D.M.P.V.W.										2.68	2.67	2.66	2.65	2.64											
050	B.C.D.M.P.V.W.										2.48	2.47	2.46	2.45	2.44											
051	B.C.D.M.P.V.W.										1.93	1.92	1.91	1.90	1.89											
052	B.C.D.M.P.V.W.										2.53	2.52	2.51	2.50	2.49											
053	B.C.D.M.P.V.W.										3.13	3.12	3.11	3.10	3.09											
054	B.C.D.M.P.V.W.										2.73	2.72	2.71	2.70	2.69											
055	B.C.D.M.P.V.W.										3.03	3.02	3.01	3.00	2.99											
056	B.C.D.M.P.V.W.										2.83	2.82	2.81	2.80	2.79											
057	B.C.D.M.P.V.W.										2.98	2.97	2.96	2.95	2.94											
058	B.C.D.M.P.V.W.										3.06	3.07	3.06	3.05	3.04											
059	B.C.D.M.P.V.W.										2.11	2.10	2.09	2.08	2.07											
060	B.C.D.M.P.V.W.										2.13	2.12	2.11	2.10	2.09											
061	B.C.D.M.P.V.W.										2.77	2.77	2.76	2.75	2.74											

COEFFICIENTS:
a or b
SCHEDULES

7 13 19 25 31 37 43 49 55 61 67 73 76

— IDPVAR(1) IDPVAR(2) IDV

NASA-MSC-WAF

ORIGINAL PAGE IS
OF POOR QUALITY

91

TABLE 1 - Concluded
TEST 66-605 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	PARAMETERS/VALUES					NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)								TEST RUN NUMBERS									
			a	b	c	d	e		06	09	12	15	20	23	26	29										
RBE 061	B,C,D,M,P,V,W	A	0	0	0	0	0	5	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196
062	B,C,D,M,P,V,W	A	0	0	0	0	0	5	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196
063	B,C,D,M,P,V,W	A	0	0	0	0	0	5	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196
064	B,C,D,M,P,V,W	A	0	0	0	0	0	5	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196
065	B,C,D,M,P,V,W	A	0	0	0	0	0	5	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196
066	B,C,D,M,P,V,W	A	0	0	0	0	0	5	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196
067	B,C,D,M,P,V,W	A	0	0	0	0	0	5	213	212	211	210	209	208	207	206	205	204	203	202	201	200	199	198	197	196

1 7 13 19 25 31 37 43 49 55 61 67 73 79

COEFFICIENTS: _____

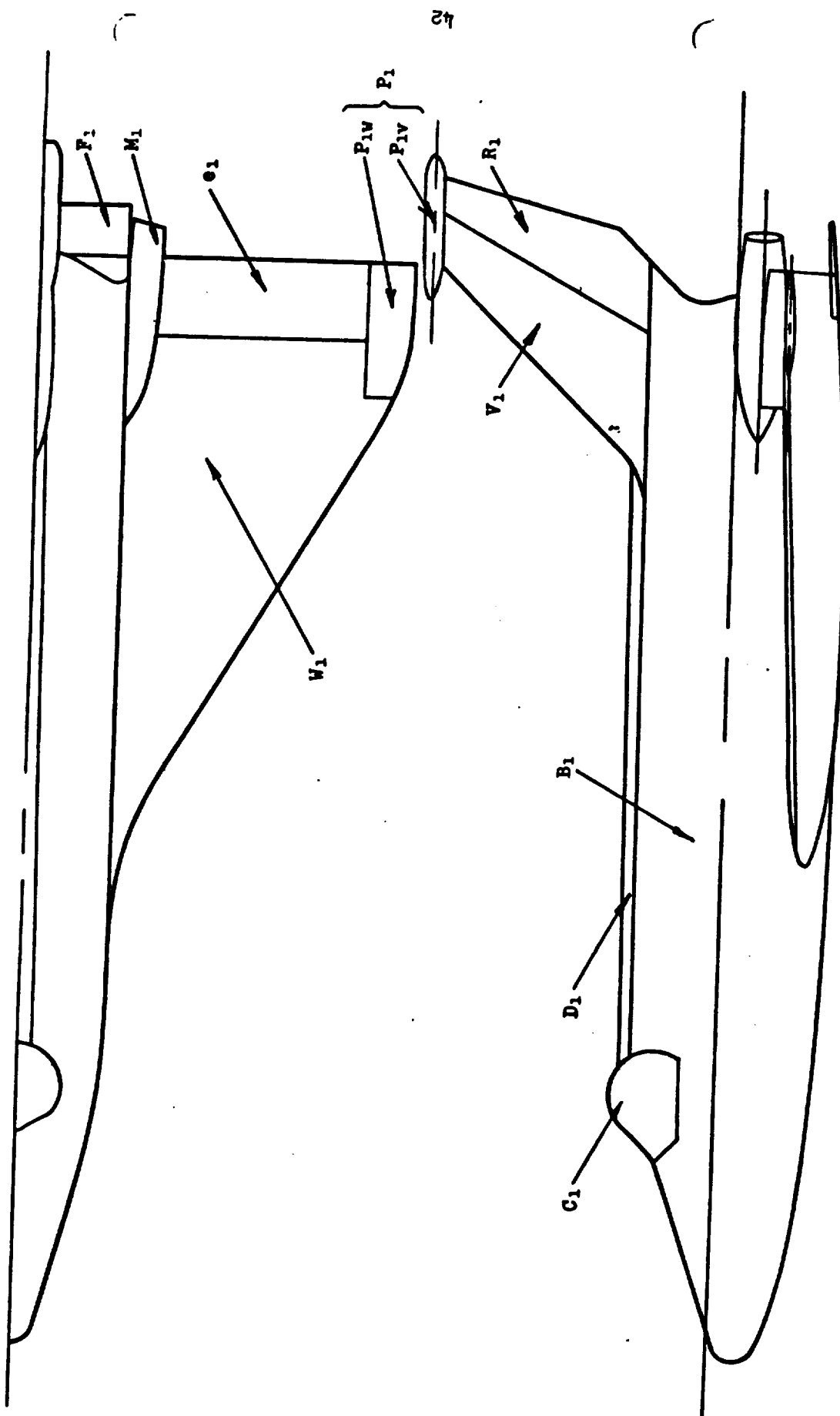
a of b _____

SCHEDULES _____

NASA-MSFC-MAP

DELTA WING ORBITER
MSC
DR#1202 B-1- 367

469

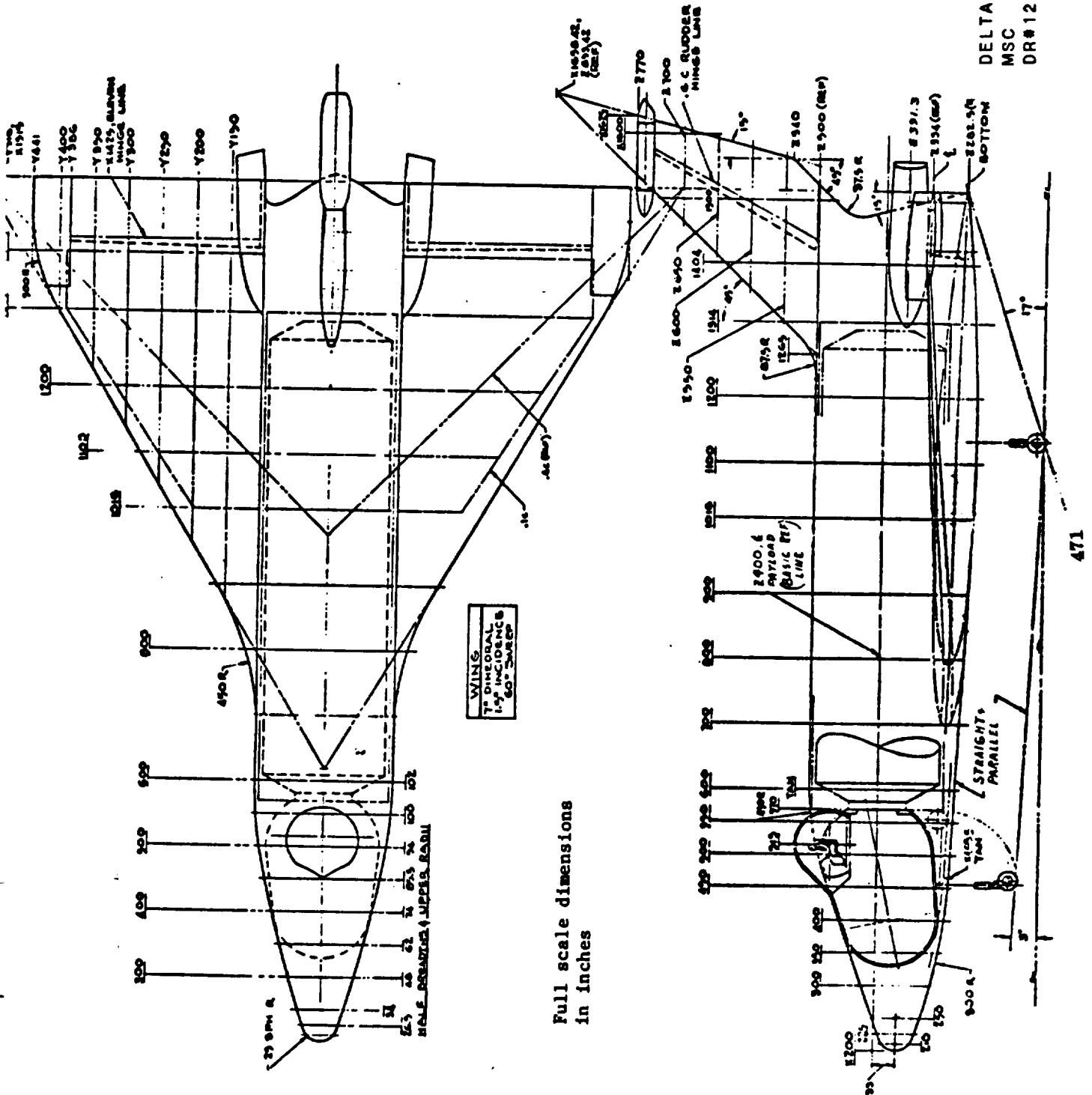


(a) Model component identification

Figure 2.- Model description.

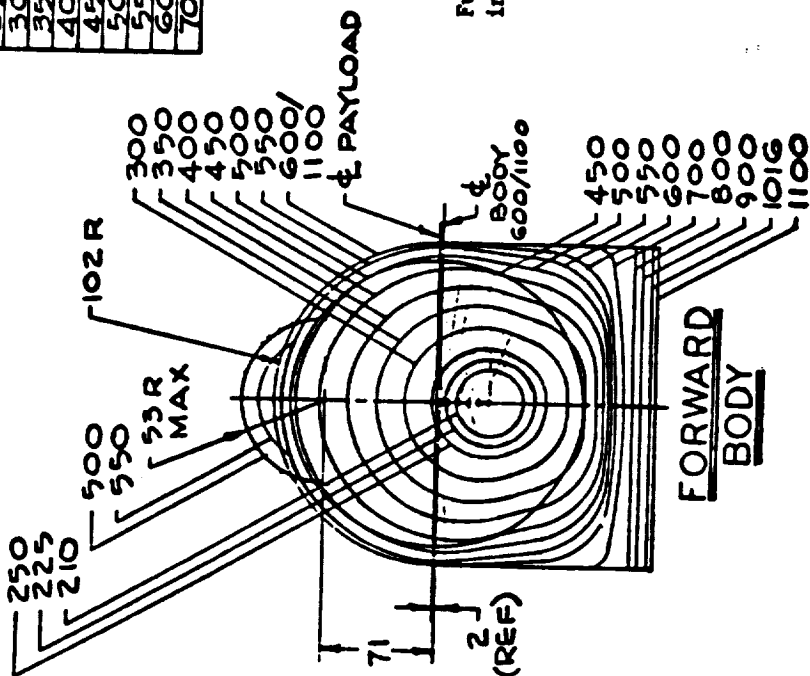
(b) Side and top views of MSC 040A configuration

DELTA WING ORBITER
MSC
DR#1202 B-1- 369

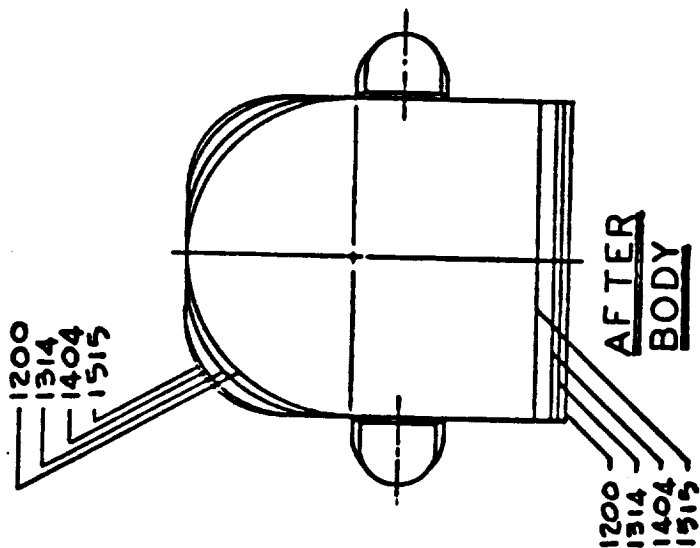


ORIGINAL PAGE IS
OF POOR QUALITY

GENERATION DATA		
STATION	FLARE	CHINE R
250	22°30'	30
300	21°	36.5
350	18°25'	42
400	16°	46.5
450	13°45'	49
500	10°	50
550	6°45'	49
600	3°30'	43.5
700	0°(40')	14



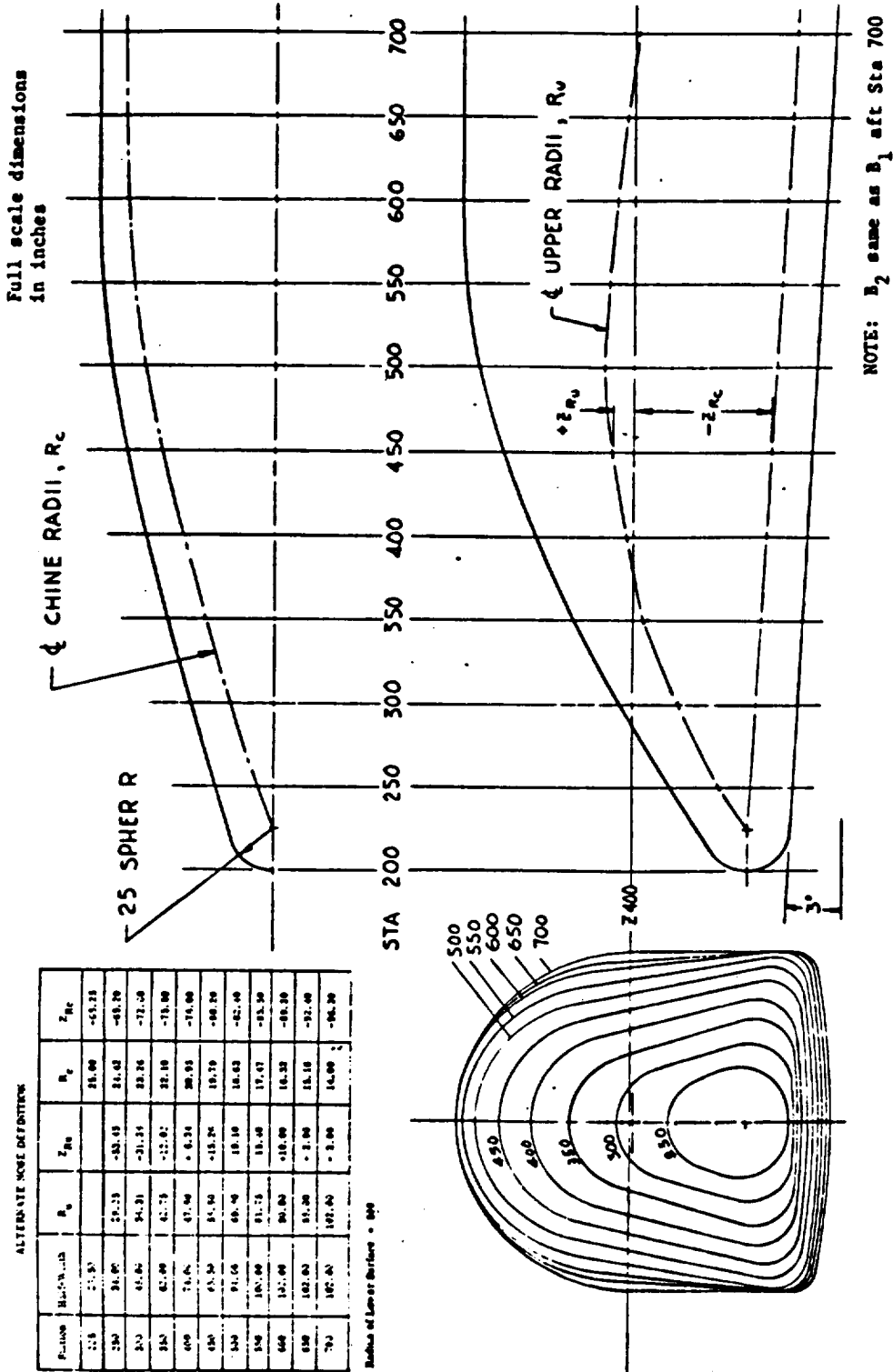
Full scale dimensions
in inches



(c) Cross-sections of B₁ body

Figure 2.- Continued.

ORIGINAL PAGE IS
OF POOR QUALITY



(d) Body B_2

Figure 2.- Continued.

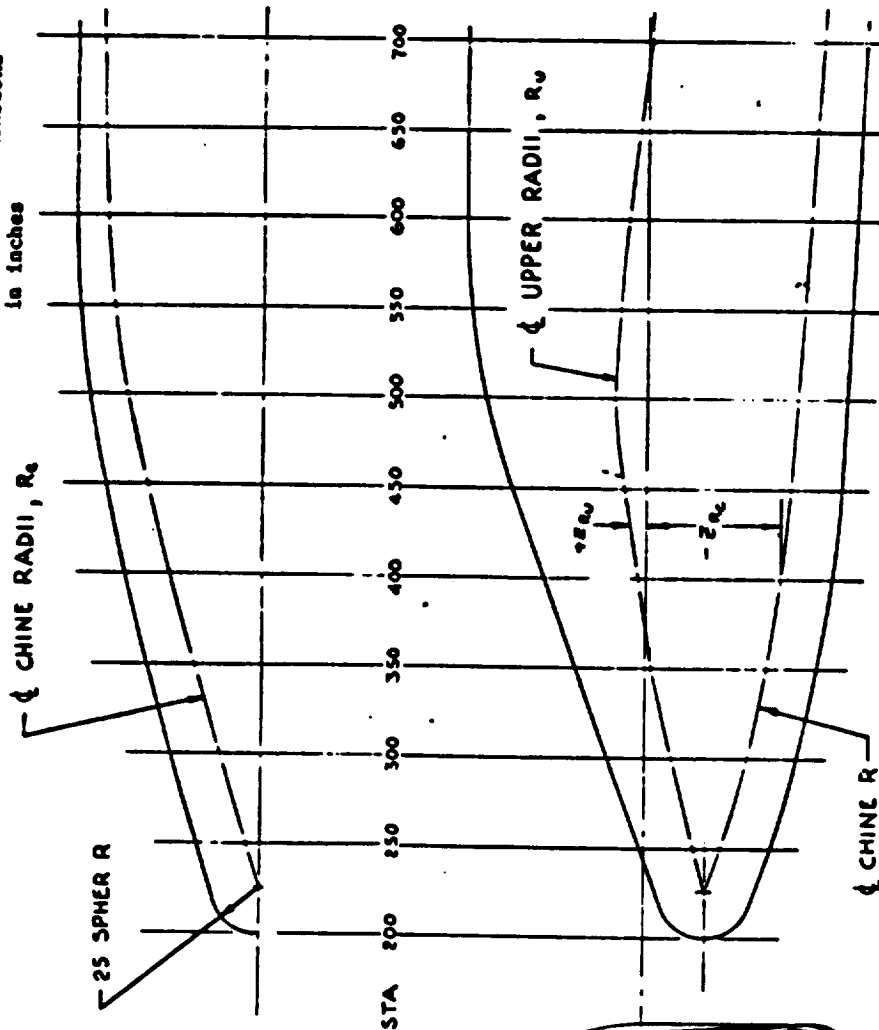
DELTA WING ORBITER
MSC
DR#1202 B-1- 371

ALTERNATE NOSE DEFINITION

Station	Radius	R_{10}	R_{100}	R_{100}	R_{100}
275	25.00			25.00	-24.25
280	24.00	25.75	-25.00	24.00	-23.10
290	24.00	24.25	-15.00	23.00	-21.00
300	23.00	22.75	-5.00	22.00	-20.00
400	24.00	21.00	-2.75	20.00	-18.00
410	23.00	20.00	15.00	15.75	-16.00
500	24.00	21.75	15.00	15.00	-15.00
510	24.00	20.00	15.00	15.00	-15.00
600	24.00	20.00	15.00	15.00	-15.00
700	24.00	20.00	15.00	15.00	-15.00

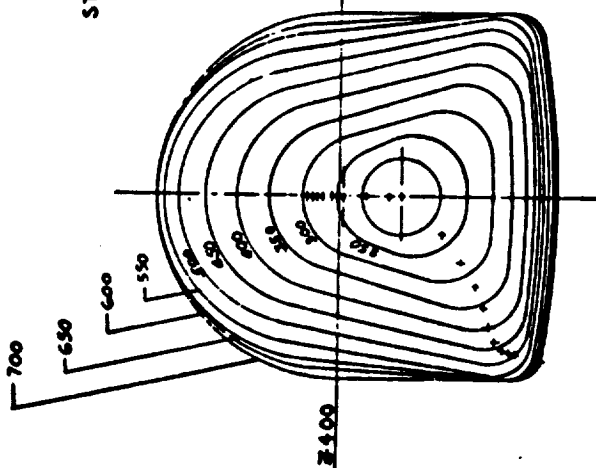
Radius of Lower Surface = 200

Full scale dimensions
in inches



(*) Body B₃

Figure 2.- Continued.

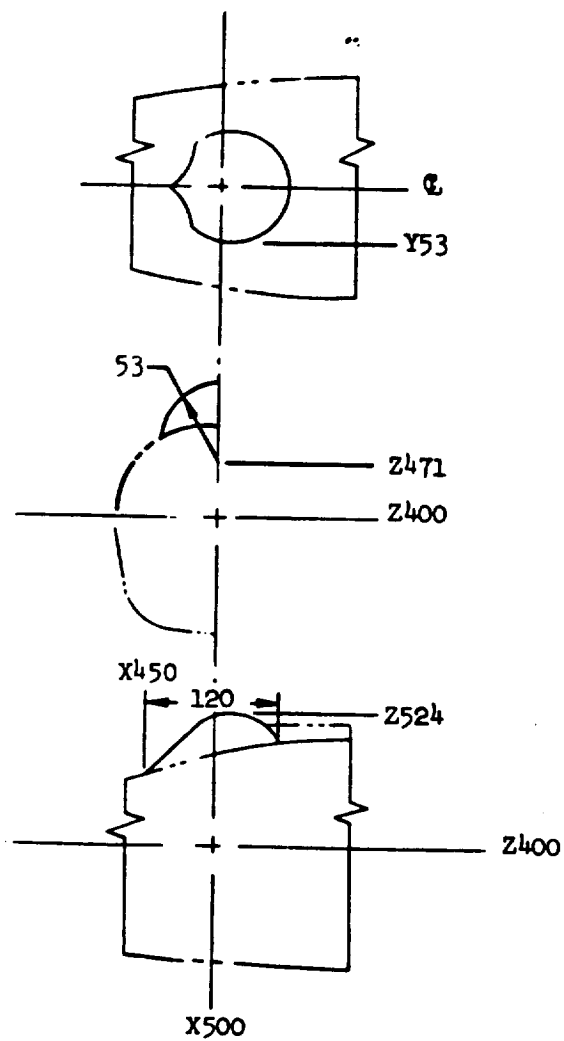


ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

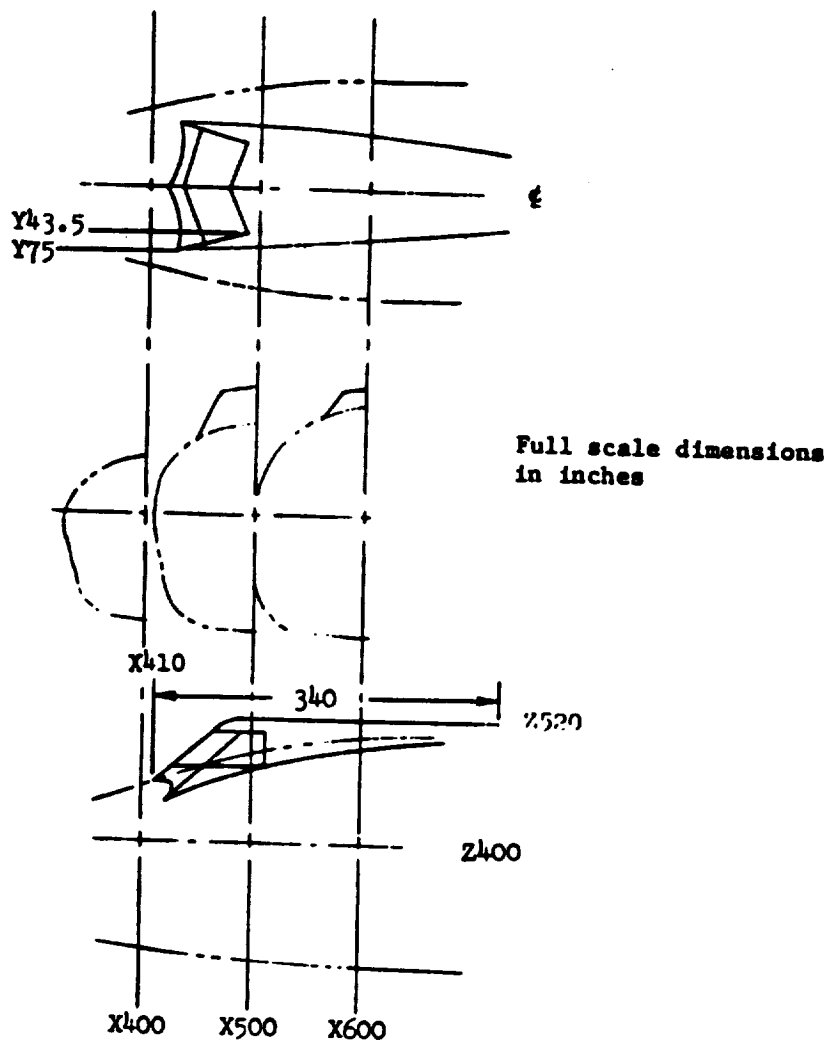
DELTA WING ORBITER
MSC
DR#1202 B-1- 373

Full scale dimensions
in inches



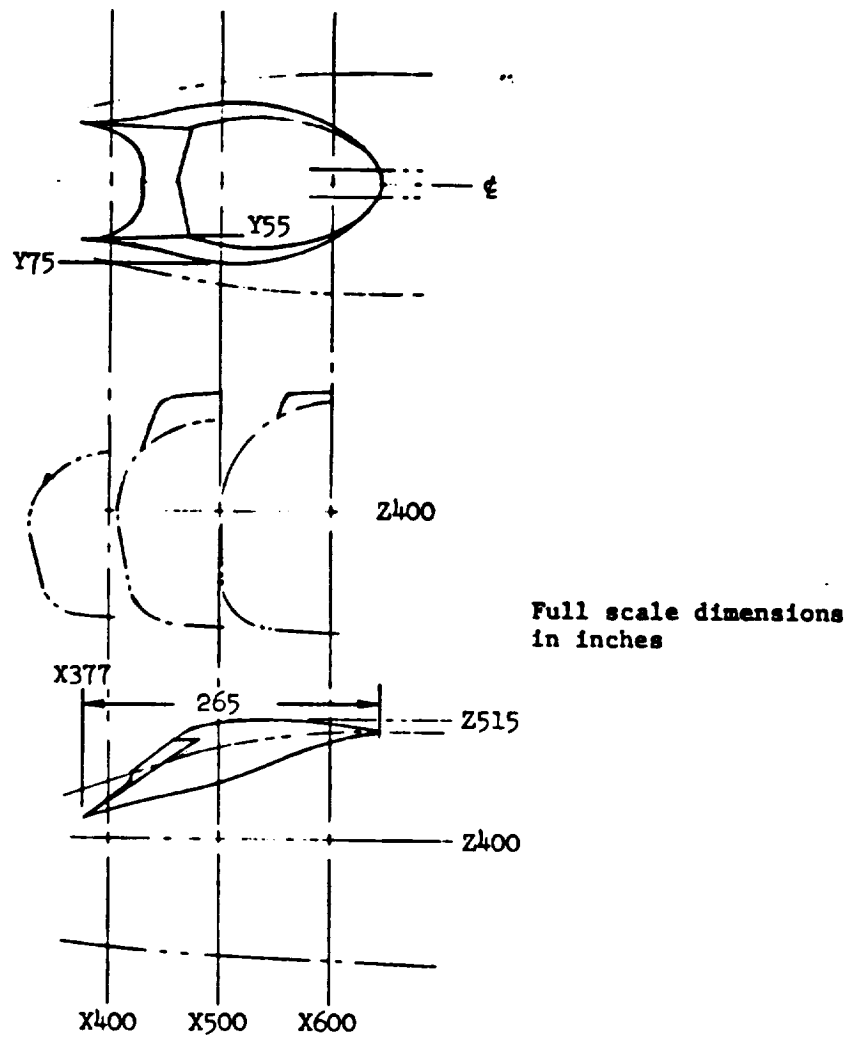
(f) Canopy C₁

Figure 2.- Continued.



(g) Canopy C2, NR alternate configuration

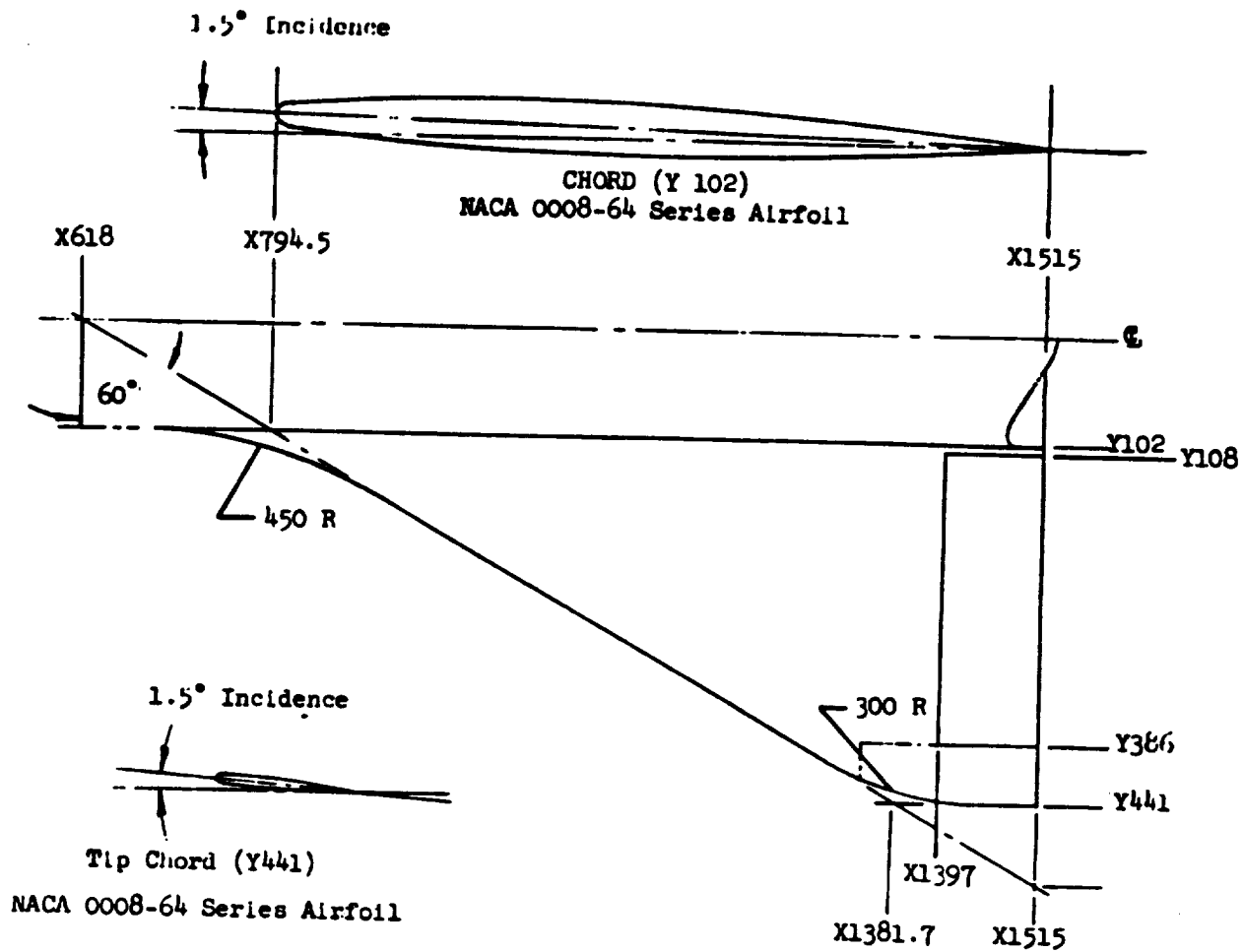
Figure 2.- Continued.



(h) Canopy C₃

Figure 2.- Continued.

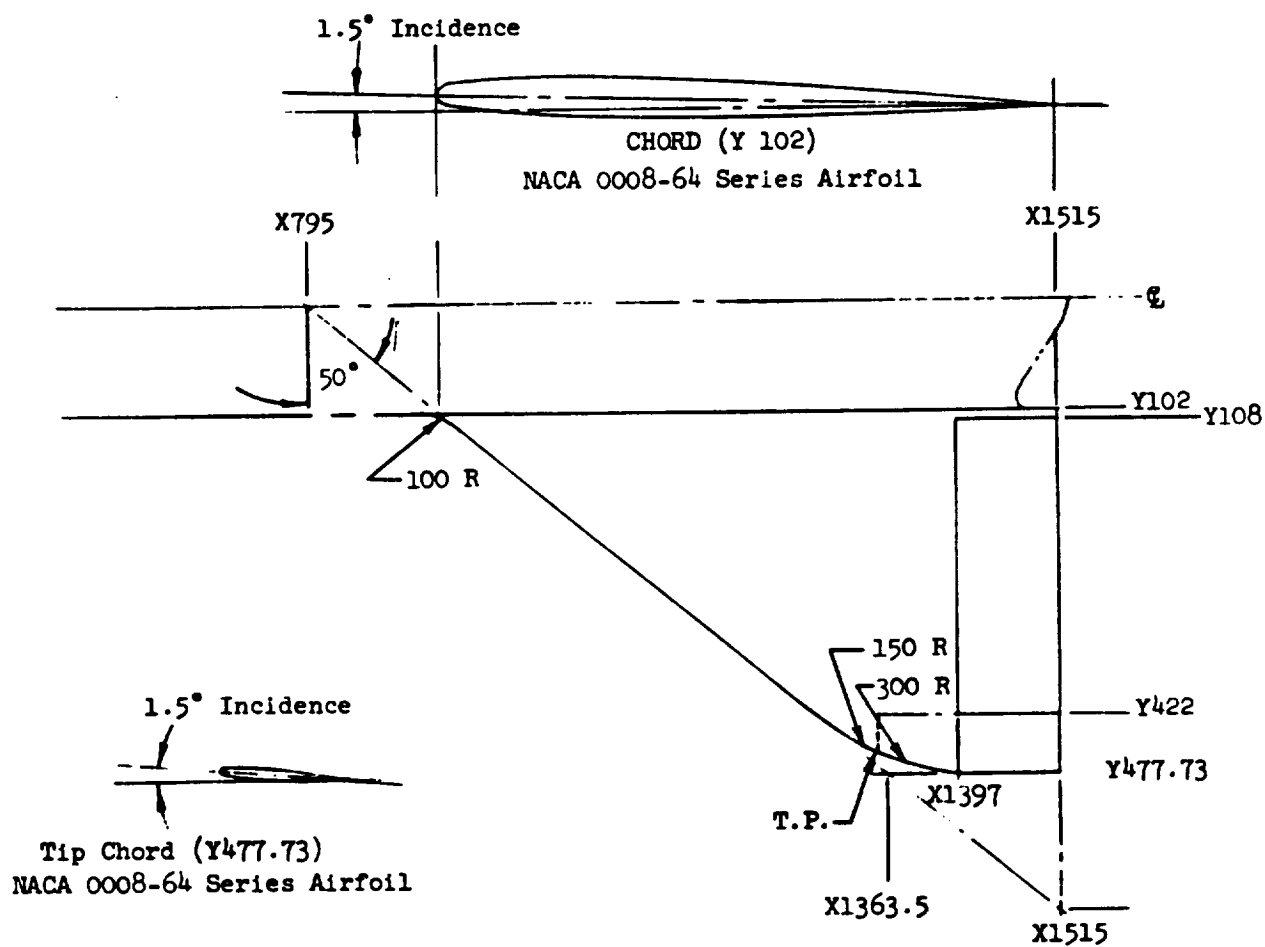
Full scale dimensions
in inches



(1) Wing W₁

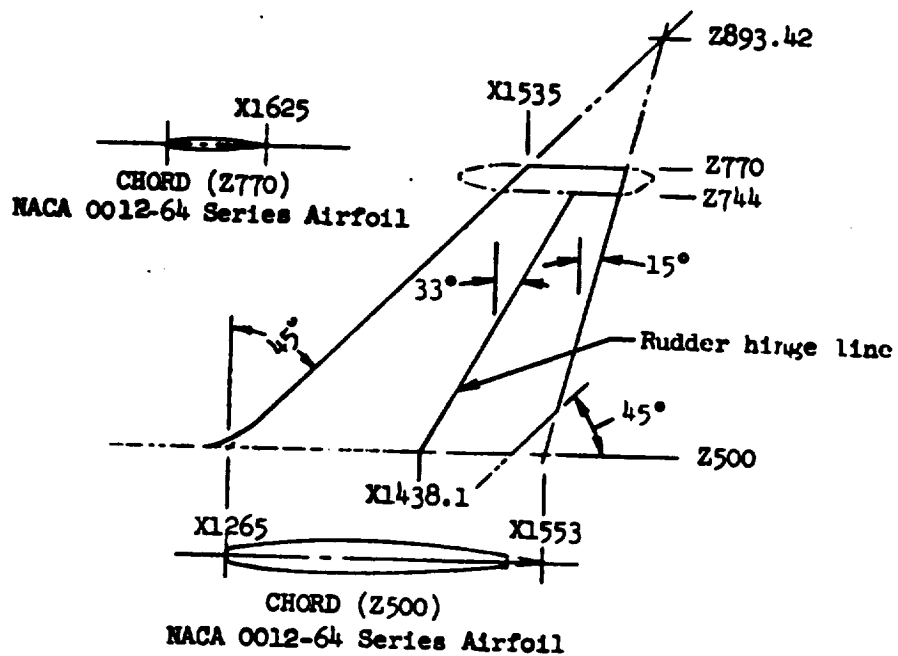
Figure 2.- Continued.

Full scale dimensions
in inches



(j) Wing W₂

Figure 2.- Continued.



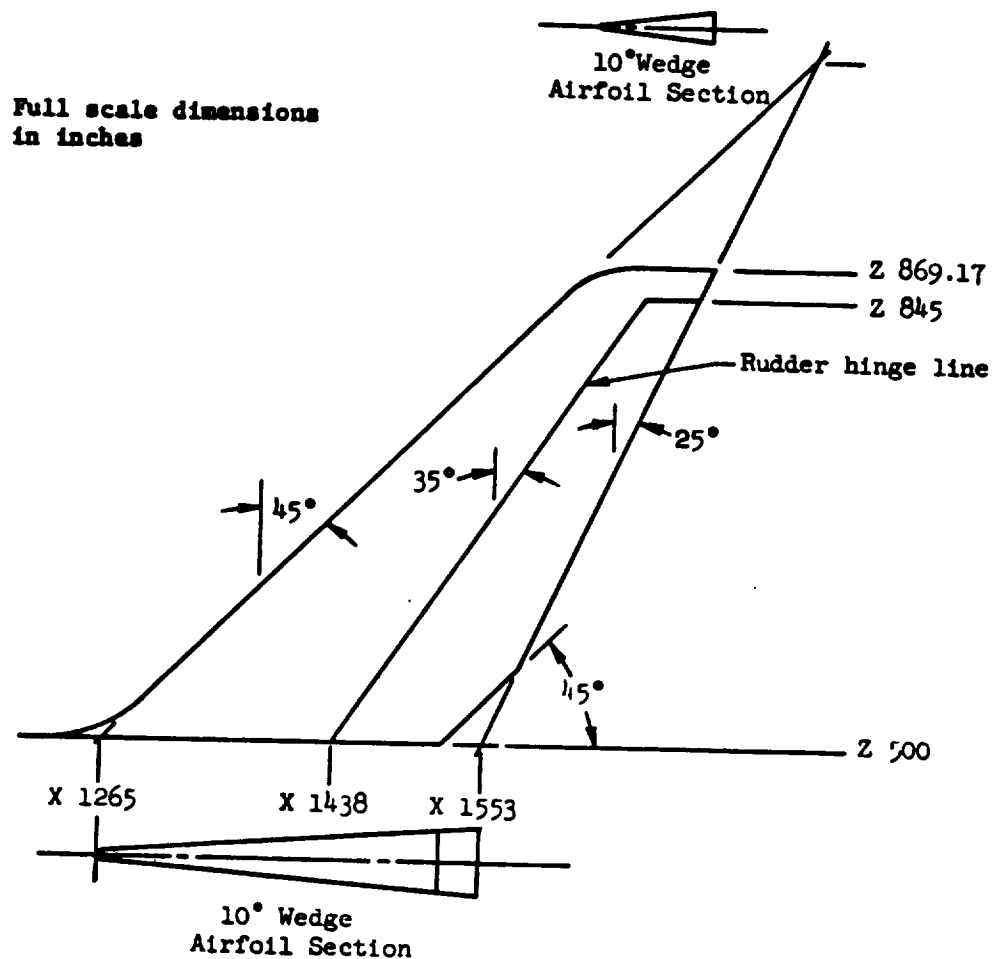
Full scale dimensions
in inches

(k) Vertical fin V₁

Figure 2.- Continued.



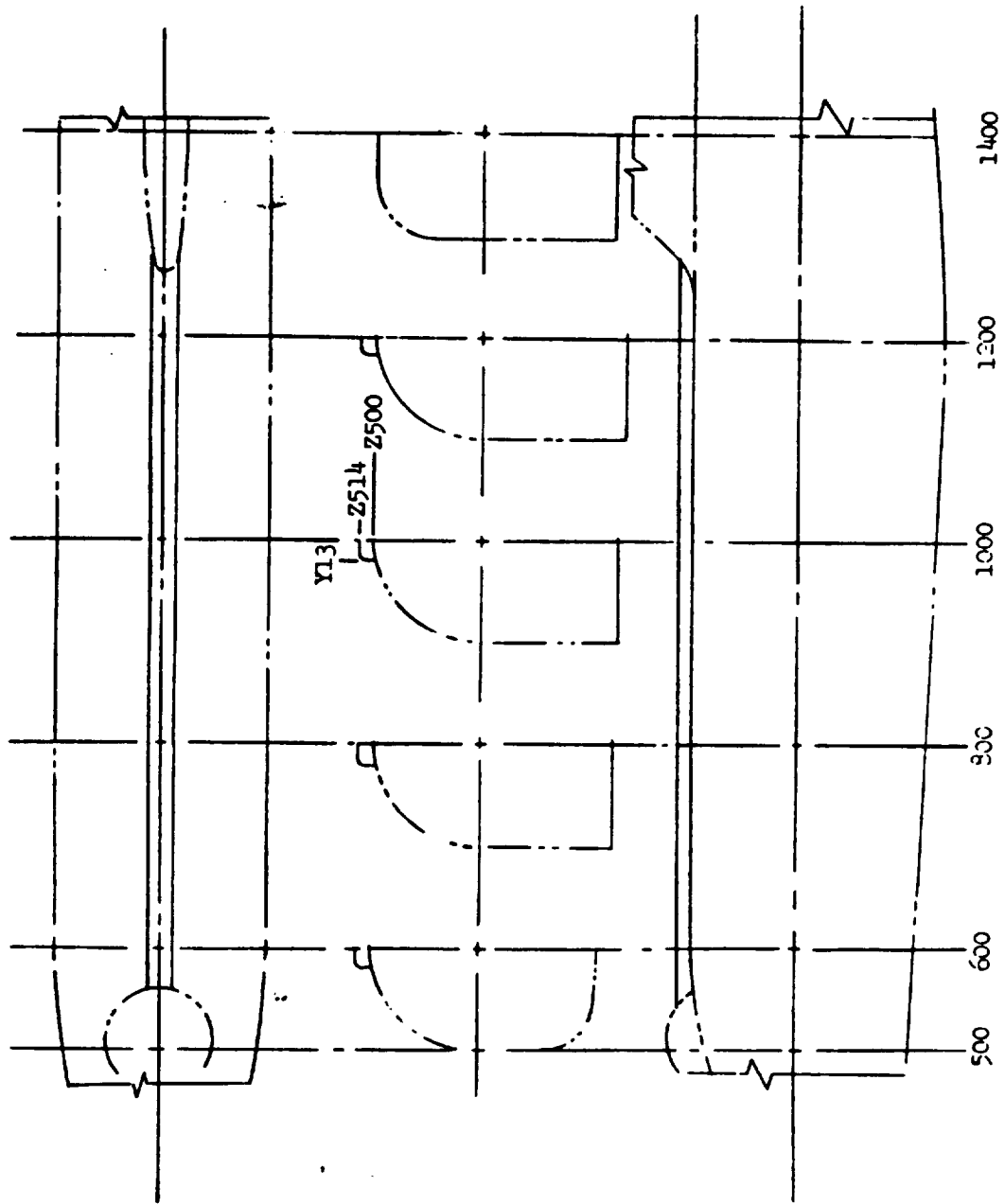
Figure 2.- Continued.



(m) Vertical fin V₅

Figure 2.- Continued.

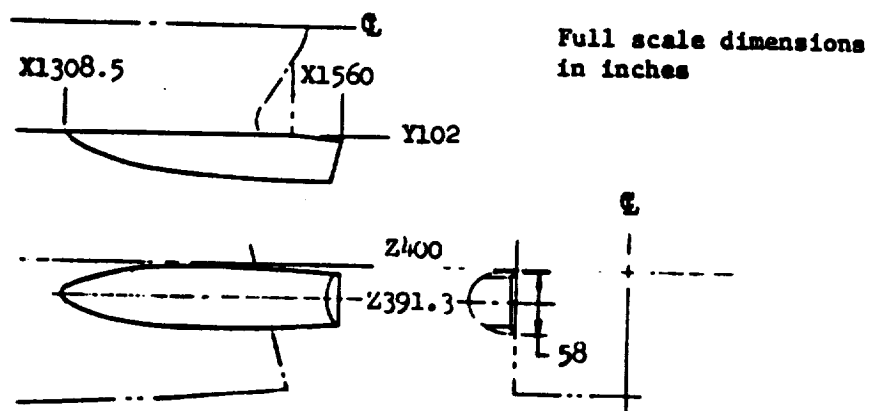
Full scale dimensions
in inches



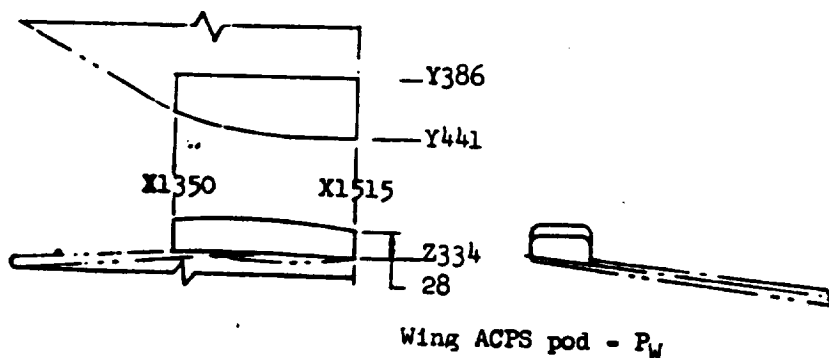
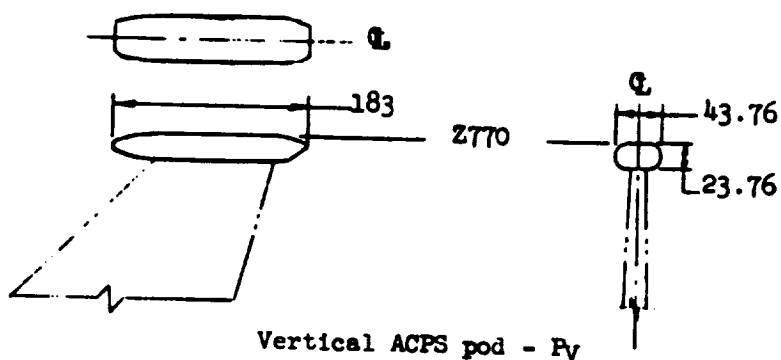
(n) Manipulator arm dorsal housing D1

Figure 2.- Continued.

DELTA WING ORBITER
MSC
DR#1202 B-1- 381

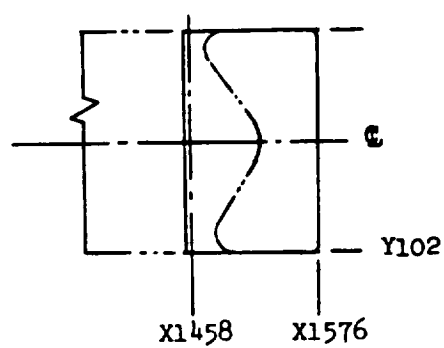


(o) Orbital maneuvering system (OMS) - M_1

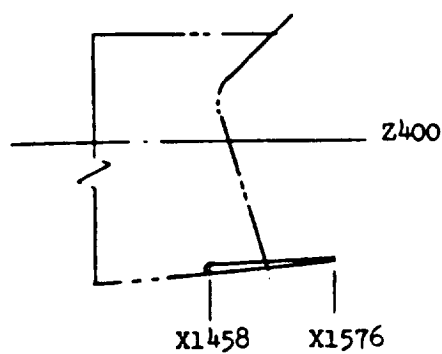


(p) Attitude control propulsion system (ACPS) pods - P_1

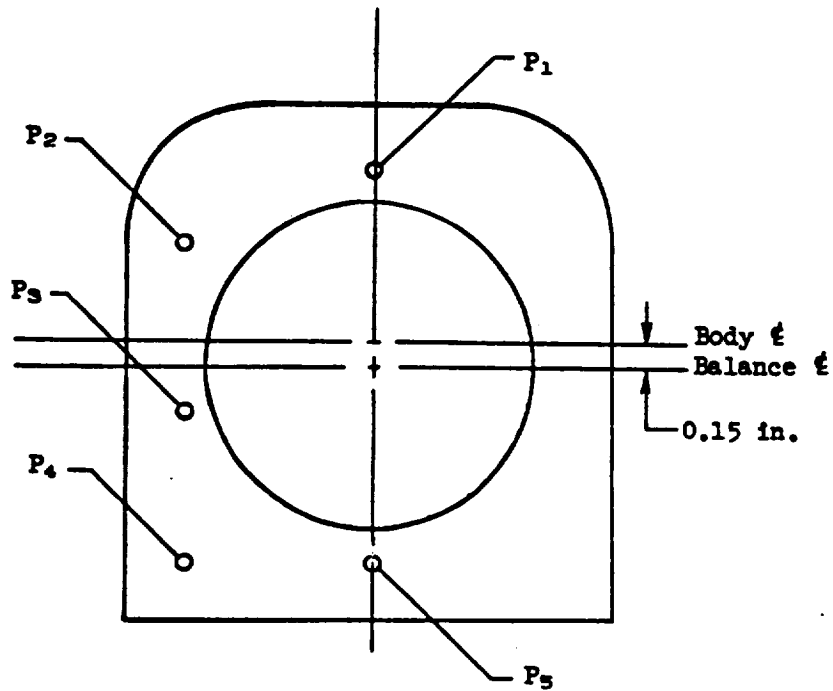
Figure 2.- Continued.



Full scale dimensions
in inches



(q) Body flap F₁



(r) Base pressure locations

Figure 2.- Concluded.

TABLE 1. TEST LARC LIFT DATA SET COLLATION SHEET
NASA SERIES S-051
MSC 040A ORBITER

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHID.		PARAMETERS/VALUES				NO. OF RUNS	R _N /L X 10 ⁻⁶									
		a	b	Se	Se	Se	Se		Se	Se	Se	Se	Se	Se	Se	Se	Se	Se
R01001	BIC1D1W1V1M1P1	A	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0
R01003	BIC1D1W1V1M1P1	A	0	-10	0	0	0	2	-10	-10	0	0	0	0	0	0	0	0
004				-10	0	10	0	2	0	-20	0	0	0	0	0	0	0	0
005				0	20	0	0	2	0	0	0	0	0	0	0	0	0	0
006	BIC1D1W1V1M1P1W			0	-	0	0	2	0	0	0	0	0	0	0	0	0	0
007	BIC1D1W1V1M1P1V			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
008	BIC1D1W1V1M1			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
009	BIC1D1W1V1			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
010	BIC1D1W1V1M1F1P1W1P1			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
011	BIC1D1W1V1M1P1F1			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
012	BIC1D1W1V2M1P1			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
013	BIC1D1W1V3M1P2			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
014	BIC1D1W1V1M1P1W			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
015	BIC1W1V1M1P1			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
016	BIC1D1W1V1M1P1F2			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
017	BIC1D1W1M1P1V			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
018	BIC1D1M1			-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
019	B1W1V1M1P1			0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
020	BIC1D1W1V1M1P1	Y	5	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0

BETA CN CA CAB CLM CY CYN CPL L/D Q(PSF) RN/L ALPHA

COEFFICIENTS: A: -1, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 25.

SCHEDULES B: -6, -4, -2, -1, 0, 1, 2, 4, 6, 8, 10.

NASA-MSPC-44F

DELTA WING ORBITER
MSC
DR01216 B-1- 306

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	:CID.		PARAMETERS/VALUES			NO. OF RUNS	RN/L X 10 ⁻⁶														
		a	b	Se	Gr	Se		Se	Gr	2	4	5	6	8	10	11	12	14				
R01 022	BIC1W1V1M1P1	A	5	0	0	0	2	0	0			54			53							
023	B1W1V1M1P1			0	0	0	2	0	0			55			56							
024	BIC1D1W1M1PIW			0	-	0	2	0	0			58			57							
025	BIC1D1W1V3M1P2			0	0	0	2	0	0			59			60							
026	BIC1D1W1V2M1P1			0	0	0	2	0	0			61			62							
027	BIC1D1W1V1M1PIW			0	0	0	2	0	0			63			64							
028	BIC1D1W1V1M1			0	0	0	2	0	0			65			66							
029	B1C1D1W1V1			0	0	0	2	0	0			67			68							
030	BIC1D1W1V1M1PIVPIWB			0	0	0	2	0	0			69			70							
031	BIC1D1W1V1M1PIF2			0	0	0	2	0	0			71			72							
032	BIC1D1V1M1PIV			-	0	-	2	-	-			73			74							
033	BIC1D1M1			-	-	-	2	-	-			75			76							
034	B2C1D1M1			-	-	-	2	-	-			77			78							
035	B2C1D1W2V2M1P1			0	0	0	2	0	0			79			80							
036	B2W2V2M1P1		Y	0	0	0	2	0	0			81			82							
037	B2V2V2M1P1		0	0	0	0	2	0	0			83			84							
038	B2C1C1W2V2M1P1			0	0	0	2	0	0			85			86							
039	B1C1D1W2V2M1P1		Y	0	0	0	2	0	0			85			86							
Y 040	B1C1D1W2V2M1P2	Y	5	0	0	0	2	0	0			83			84							

COEFFICIENTS: a or b	RN/L																	
	7	13	19	25	31	37	43	49	55	61	67	73	79	85	91			
SCHEDULES	A:-1,0,1,2,4,6,8,10,12,14,16,18,20,22,24,25.																	
	B:-6,-4,-2,-1,0,1,2,4,6,8,10																	

NASA-MSPC-MAP

TABLE 1. TEST LARC LIPT 85 DATA SET COLLATION SHEET (Continued)

NASA SERIES S-051
MSC 040A ORBITER

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHID.		PARAMETERS/VALUES			NO. of RUNS	DEL		RM/L X 10 ⁻⁶									
		a	b	Sc	SR	So				2	4	5	6	8	10	11	12	14	14
R01041	B2C1D1M1	A	0	-	-	-	2	-	-			91			92				
042	B2C1D1W2V2M1P1	5	B	0	0	0	2	0	0			93			94				
043	B1C1D1W1V1M1P1			0	0	0	4	0	0	102		99		101	100				
044	B1C1D1W1M1P1W			0	-	0	2	0	0			95			96				
045	B1C1D1W1V3M1P2	Y	Y	0	0	0	2	0	0			97			98				

7	13	19	25	31	37	43	49	55	61	67	73	79
RM/L												

COEFFICIENTS: A: -1, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 25

a or b

SCHEDULES

B: -6, -4, -2, -1, 0, 1, 2, 4, 6, 8, 10

NASA-MSC-MAP

DELTA WING ORBITER
MSC
DR#1215 8-1-387

ROSCOWELL AIRCRAFT COMPANY

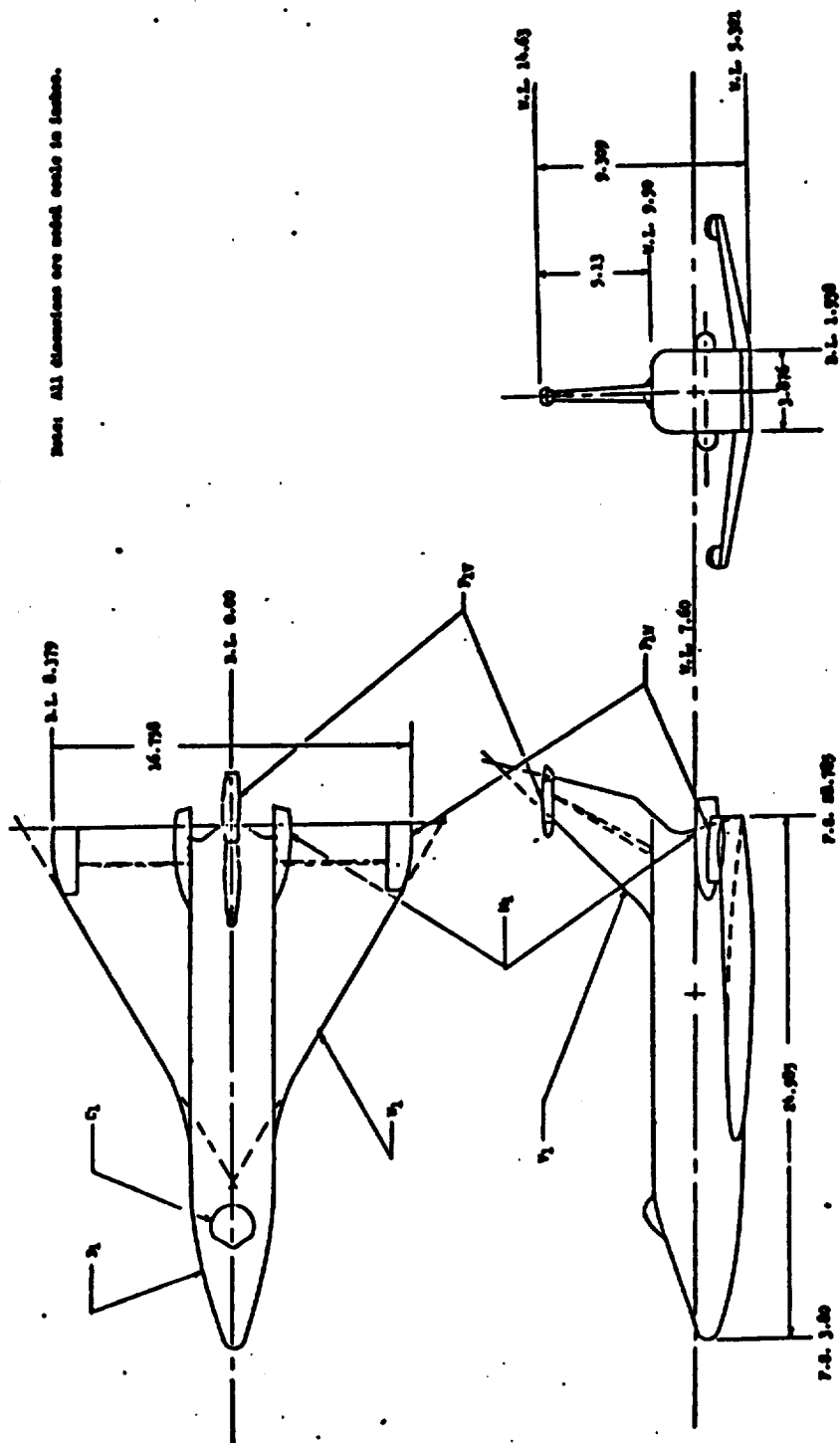


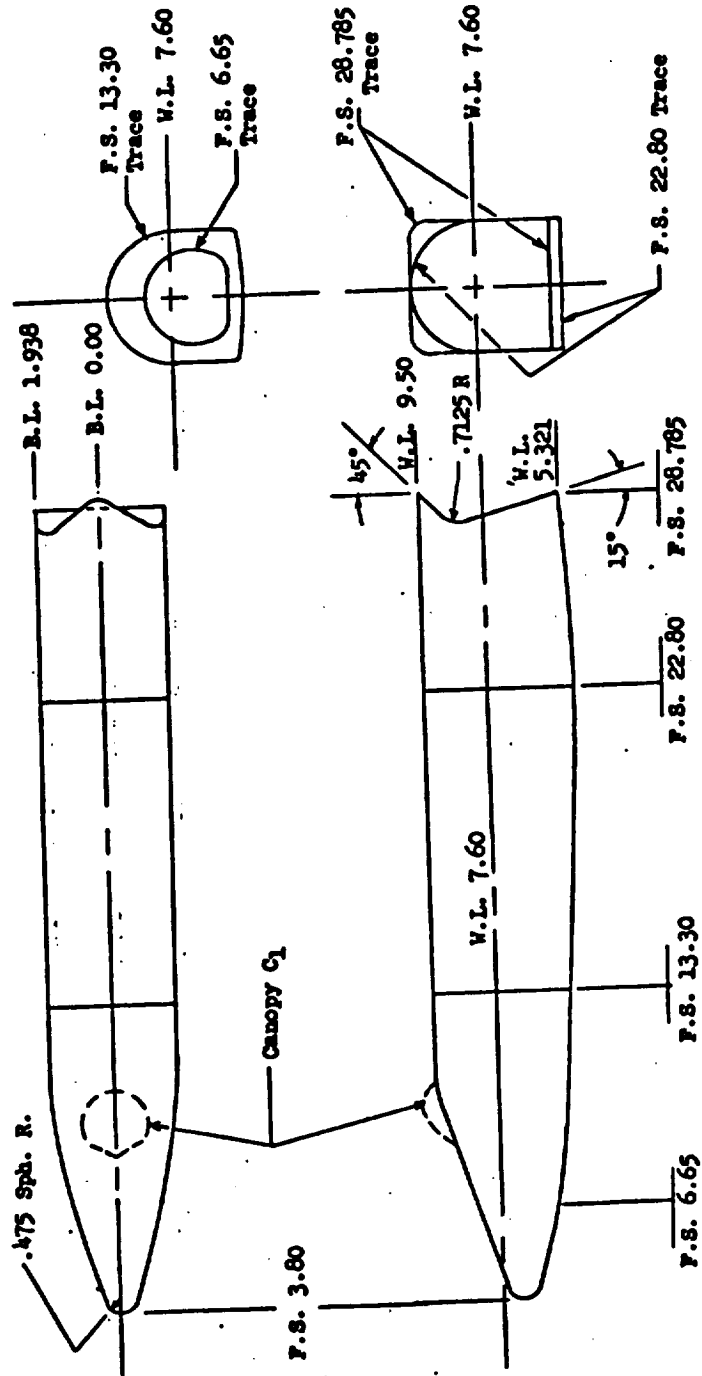
FIGURE 5. GENERAL ARRANGEMENT

ROSCOWELL AIRCRAFT COMPANY

MCDONNELL AIRCRAFT COMPANY

491

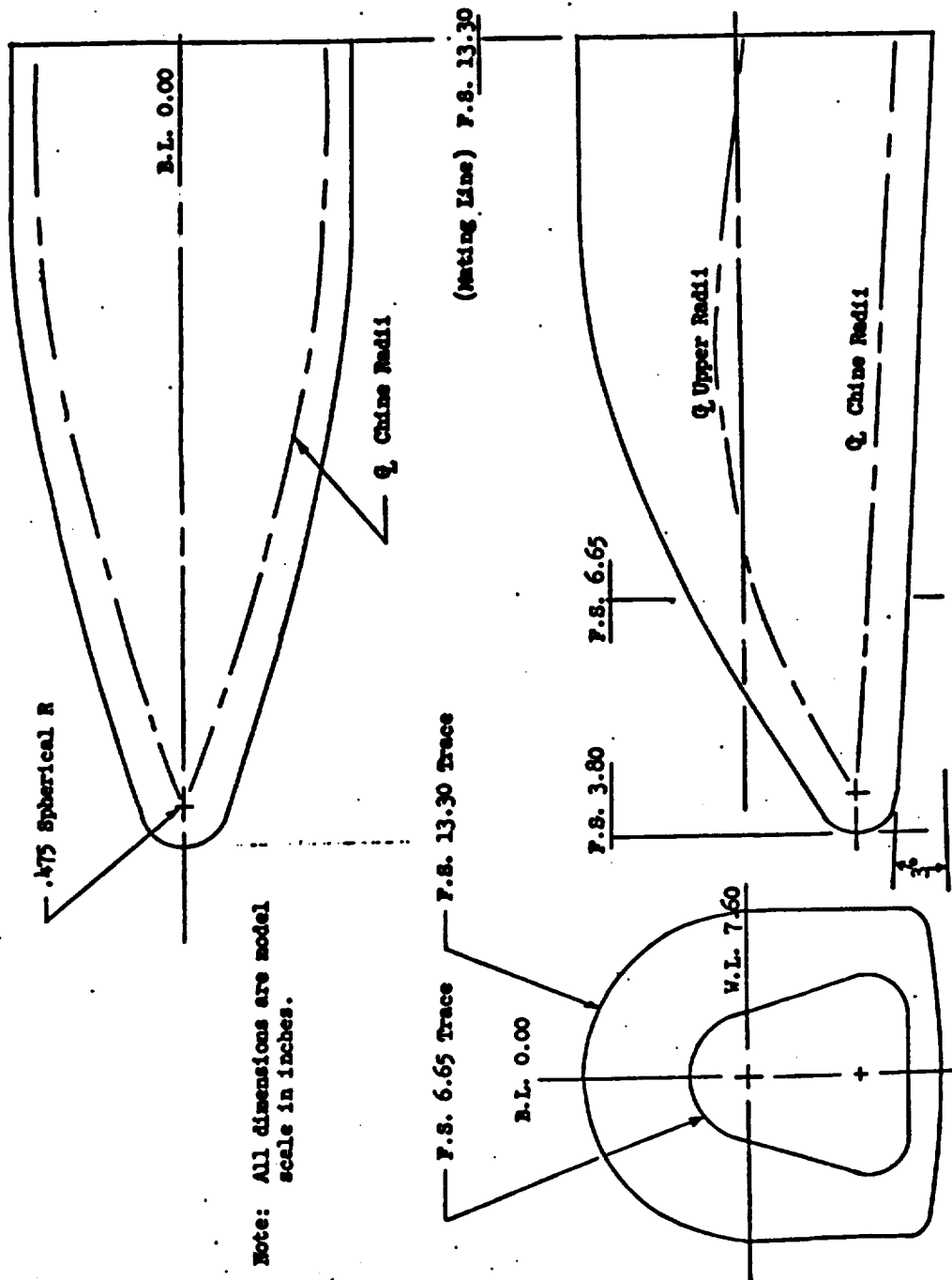
FIGURE 6. B₁ - BASELINE FUSELAGE



Note: All dimensions are model scale in inches.

MCDONNELL DOUGLAS CORPORATION

FIGURE 7. B2 - ALTERNATE NOSE



Note: All dimensions are model
scale in inches.

MCDONNELL DOUGLAS CORPORATION

ORIGINAL PAGE IS
OF POOR QUALITY

MCDONNELL AIRCRAFT COMPANY

Notes: All dimensions
are model scale
in inches.

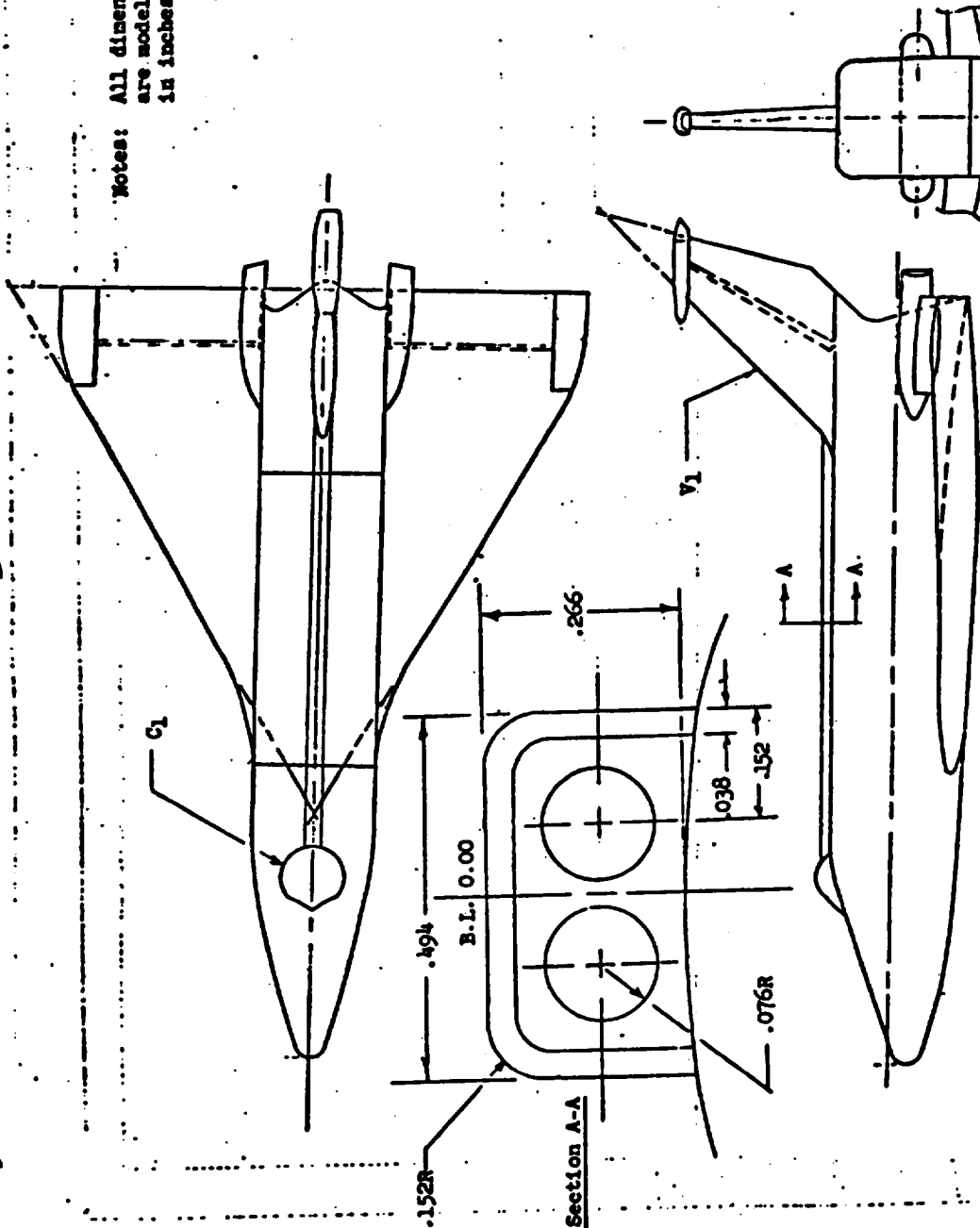


FIGURE 8. D1 - MANIPULATOR ARM DORSAL HOUSING

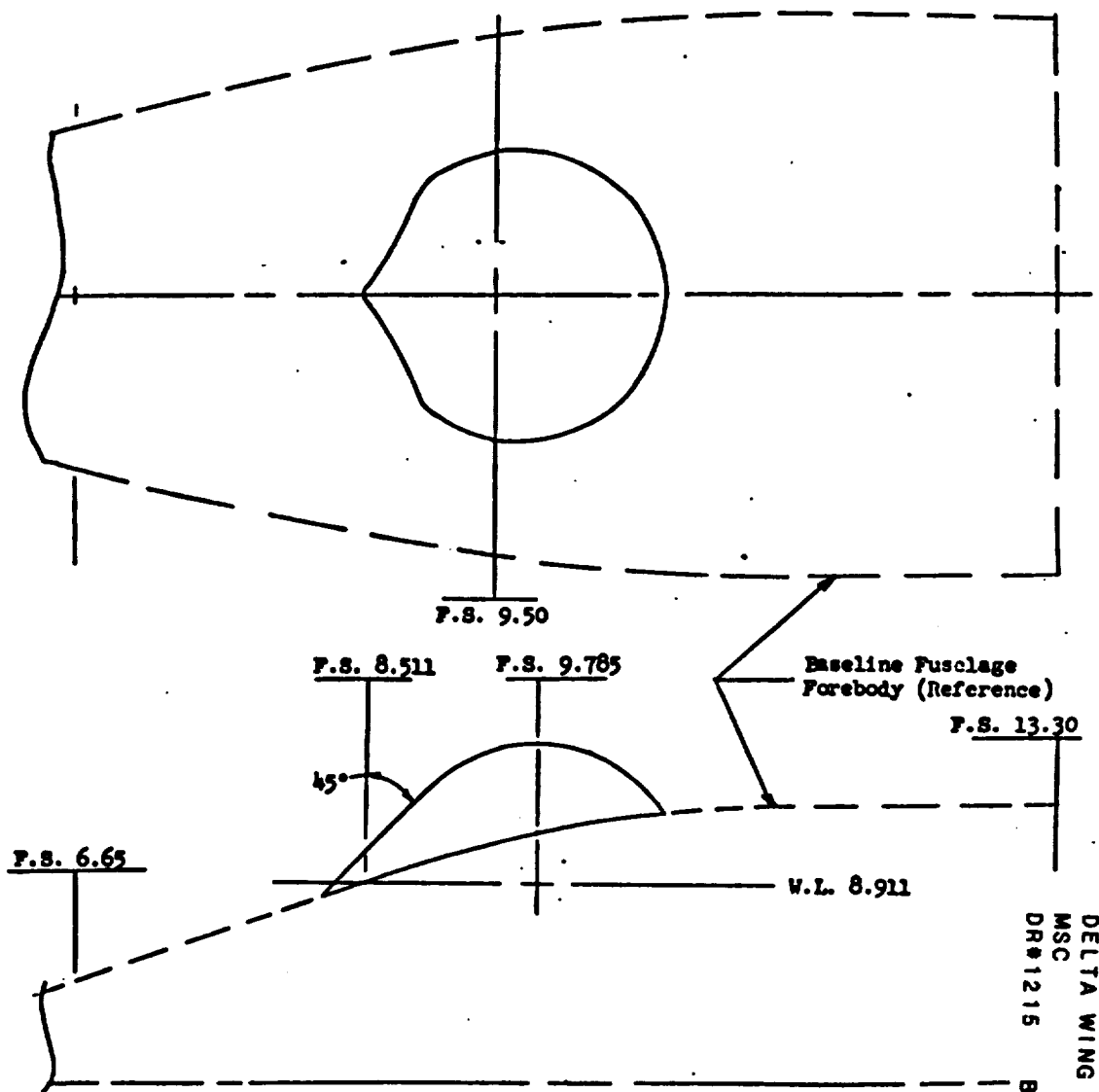
MCDONNELL DOUGLAS CORPORATION

DELTA WING ORBITER
MSC
DR#1215 B-1- 391

MCDONNELL AIRCRAFT COMPANY

FIGURE 9. C₁ - BASELINE CANOPY

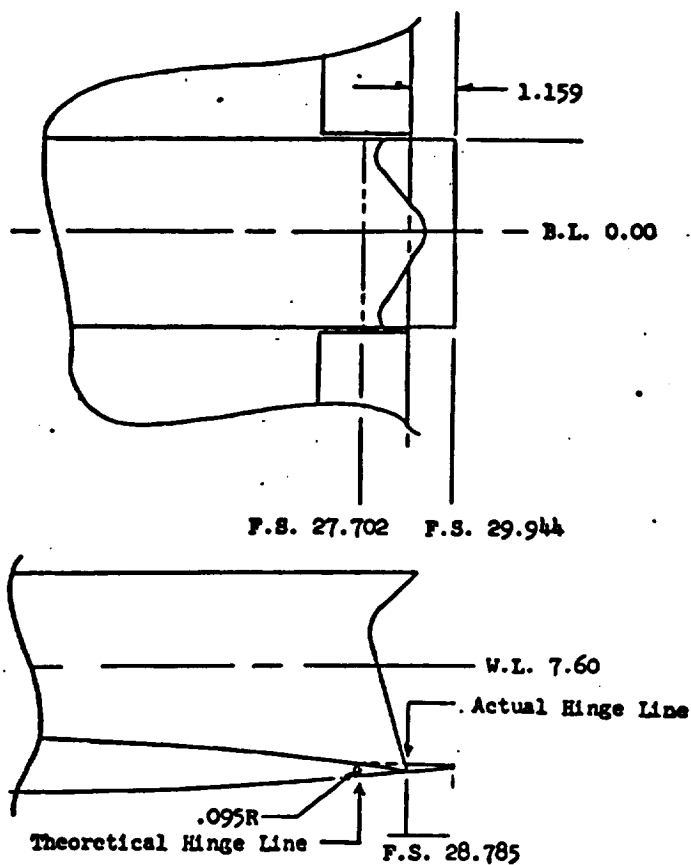
Note: All dimensions are model scale in inches.



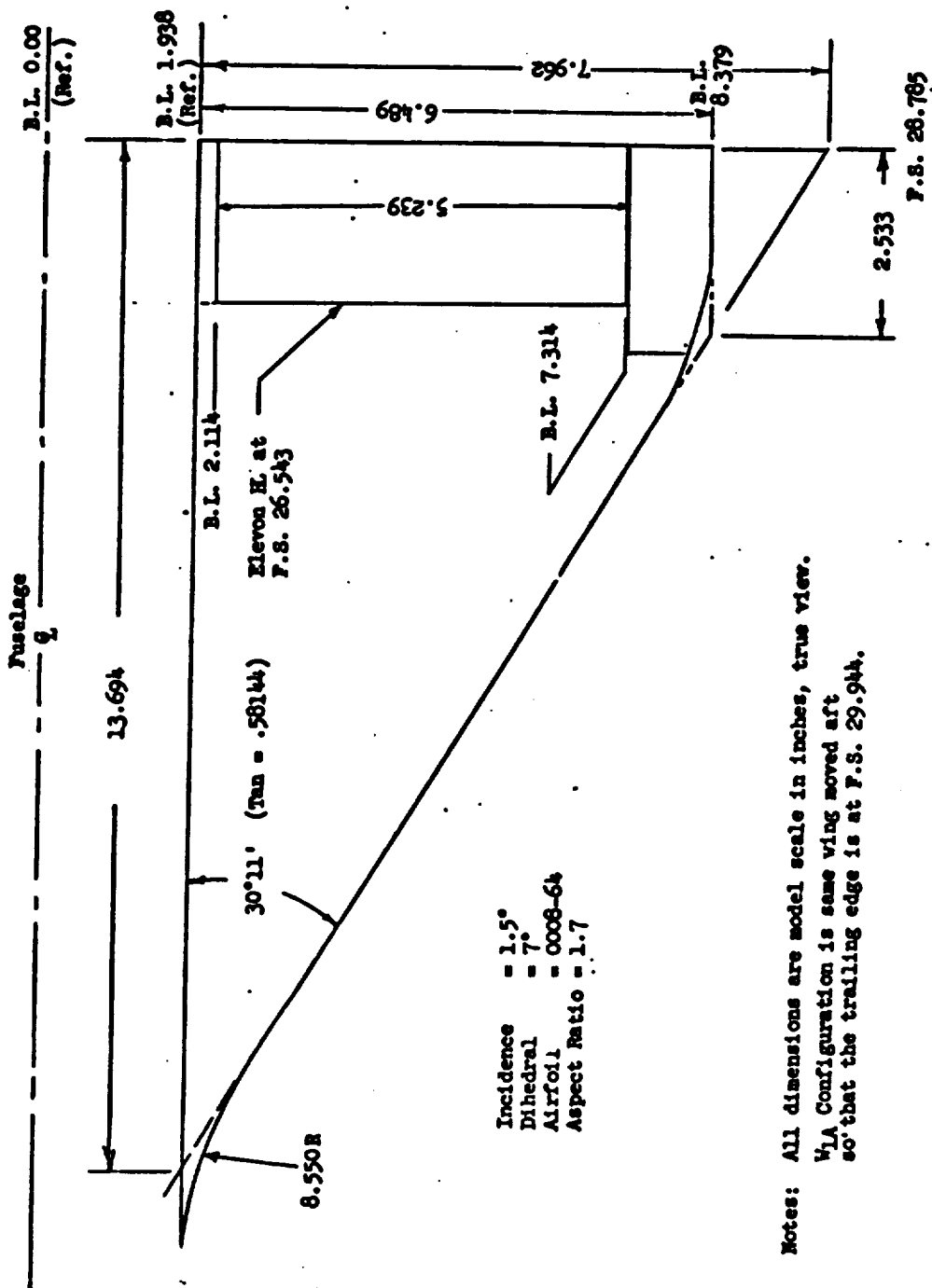
MCDONNELL DOUGLAS CORPORATION

FIGURE 10. F_1 - BODY TRAILING EDGE FLAP

Note: All dimensions are model scale in inches.



MCDONNELL AIRCRAFT COMPANY



MCDONNELL DOUGLAS CORPORATION

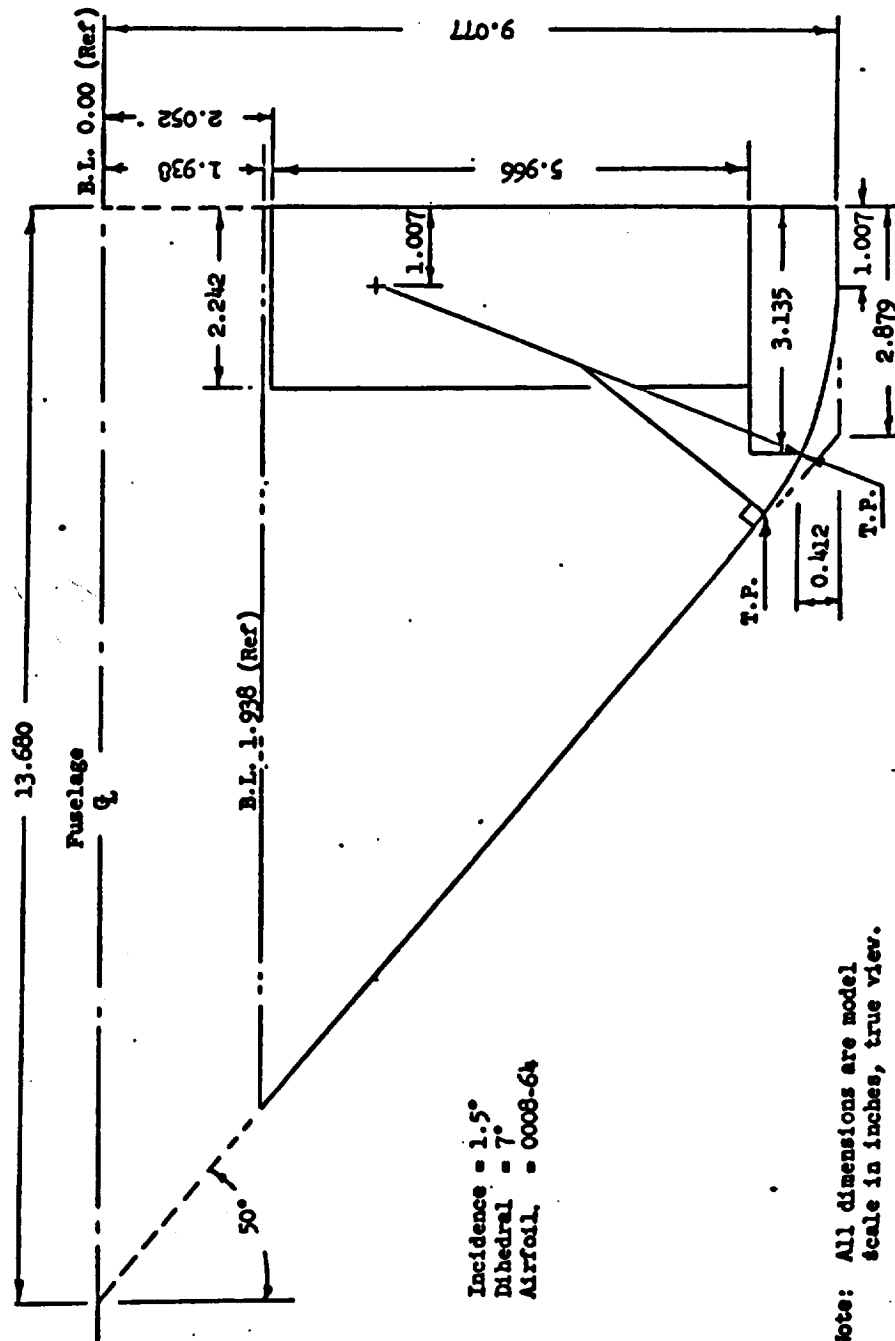
Notes: All dimensions are model scale in inches, true view.
W/A Configuration is same wing moved aft so that the trailing edge is at P.S. 29.944.

FIGURE 11. W₁ - BASELINE DELTA WING AND ELEVONS

ORIGINAL PAGE IS
OF POOR QUALITY

MCDONNELL AIRCRAFT COMPANY

FIGURE 12. W_2 - ALTERNATE WING AND ELEVONS



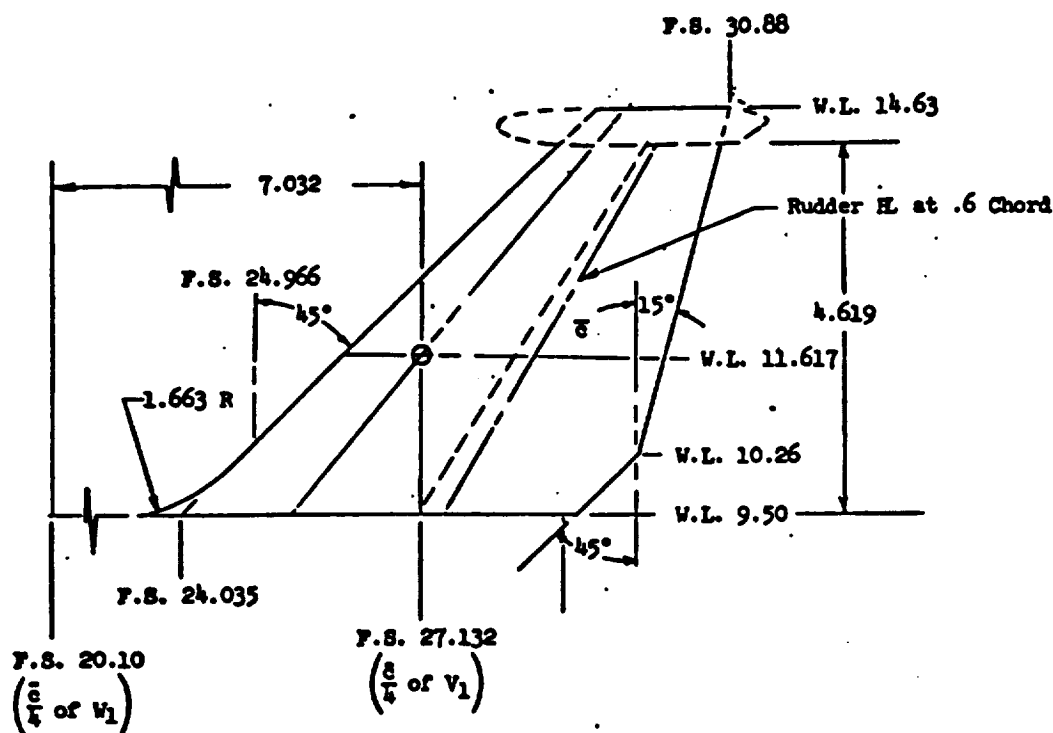
MCDONNELL DOUGLAS CORPORATION

DELTA WING ORBITER
MSC
DR#1215 B-1-395

MCDONNELL AIRCRAFT COMPANY

FIGURE 13. V_1 - BASELINE VERTICAL TAIL AND RUDDER

$S_v = 18.422 \text{ in.}^2$	$C_R = 5.472$
$b = 5.130$	$C_T = 1.710$
$\bar{v} = 3.919$	$\lambda = .31$
$AR = 1.43$	$\Lambda_{L.E.} = 45^\circ$



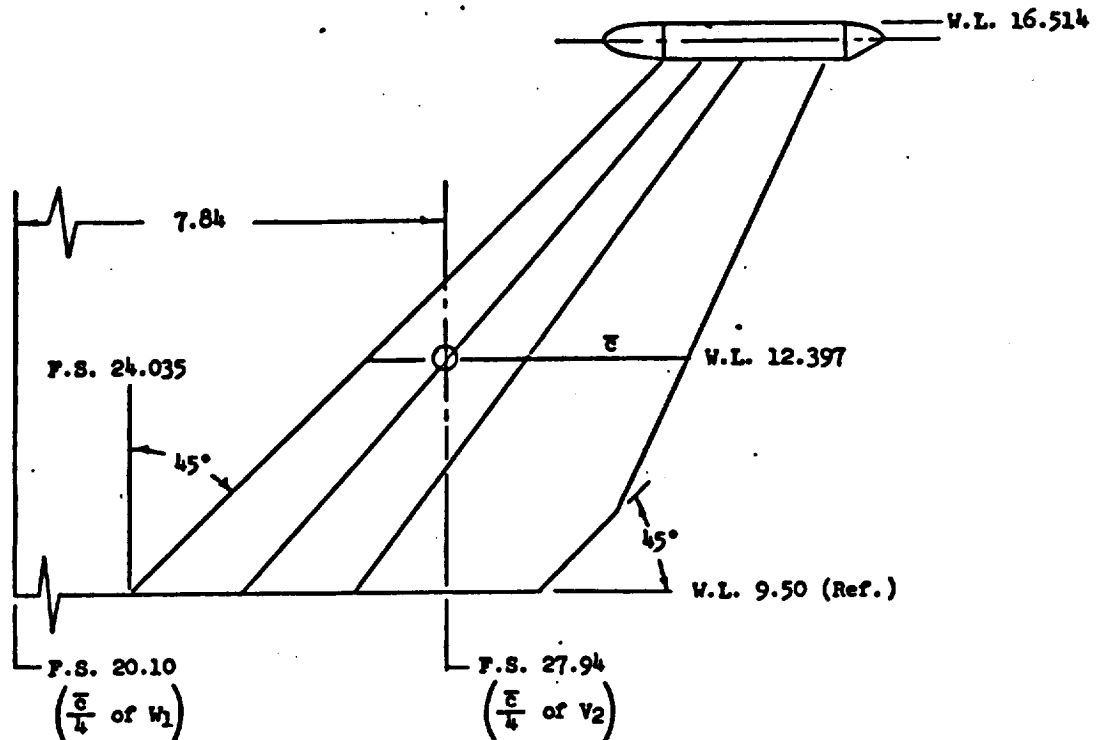
Notes: All dimensions are model scale in inches.
Vertical tail attached at B.L. 0.00.

MCDONNELL AIRCRAFT COMPANY

DELTA WING ORBITER
MSC
DR#1215 B-1-397

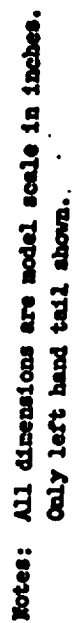
FIGURE 14. V_2 - LARGER AREA CENTERLINE VERTICAL TAIL AND RUDDER

$S_v = .175 \text{ ft.}^2$	$C_R = 5.472$
$b = 7.014 \text{ (0.585 ft.)}$	$C_T = 1.717$
$\bar{e} = 3.922 \text{ (0.327 ft.)}$	$\lambda = 0.31$
$AR = 1.95$	$\Lambda_{L.E.} = 45^\circ$



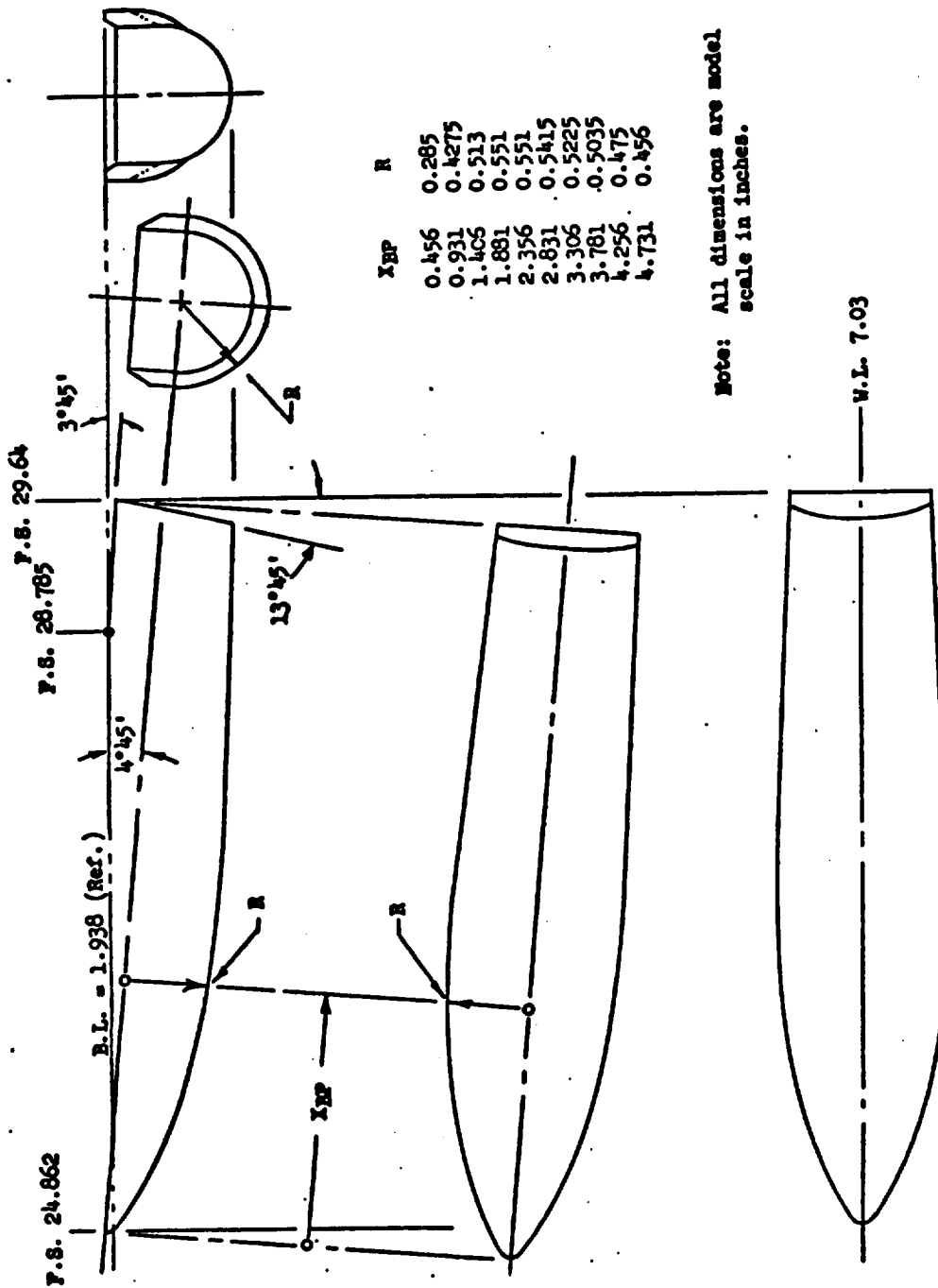
Note: All dimensions are model scale in inches.

MCDONNELL DOUGLAS CORPORATION



ORIGINAL PAGE IS
OF POOR QUALITY

MCDONNELL AIRCRAFT COMPANY



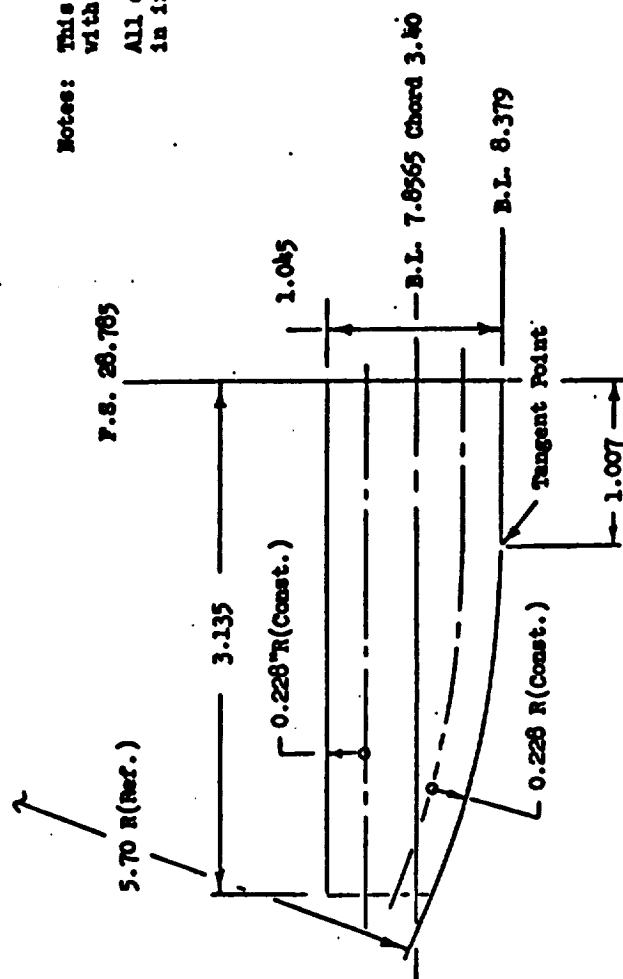
MCDONNELL DOUGLAS CORPORATION

FIGURE 16. MQ - BASELINE ORBITAL MANEUVERING SYSTEM (OMS) ENGINE POD

DELTA WING ORBITER
MSC
DR#1215 B-1- 399

Notes: This pod configuration is used with W_1 and W_2 wings.

All dimensions are model scale in inches.



MCDONNELL DOUGLAS CORPORATION

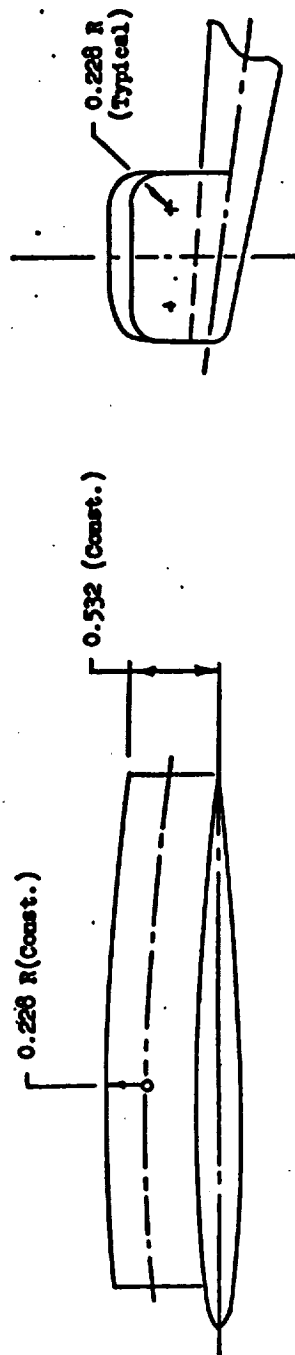


FIGURE 17. P_{1W} - BASELINE WING (W_1) ACP3 PODS

ORIGINAL PAGE IS
OF POOR QUALITY

MCDONNELL AIRCRAFT COMPANY

X Inches	Y Inches
0	0
0.0109	0.0352
0.0163	0.0430
0.0271	0.0556
0.0543	0.0779
0.1085	0.1094
0.1629	0.1331
0.2171	0.1522
0.3257	0.1812
0.4343	0.2018
0.5429	0.2157
0.6514	0.2235
0.7600	0.2257

L.E. Rad. = 0.0460

Note: All dimensions are model scale in inches.

One Half Body of Revolution Created
Through Use of NACA 633-018 Airfoil.
Typical Each Corner.

MCDONNELL DOUGLAS CORPORATION

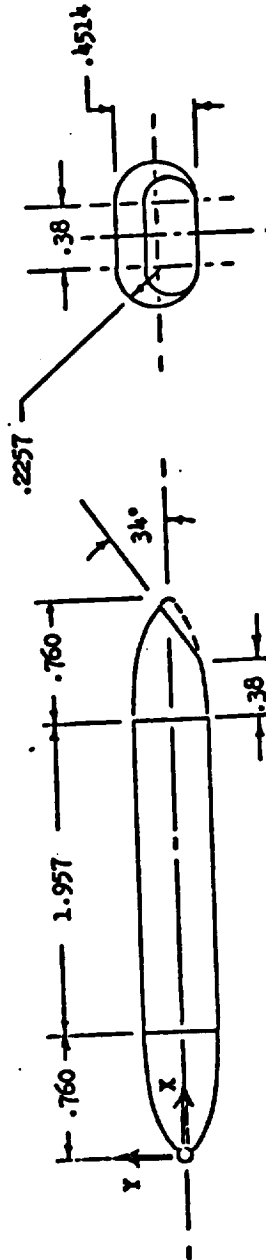


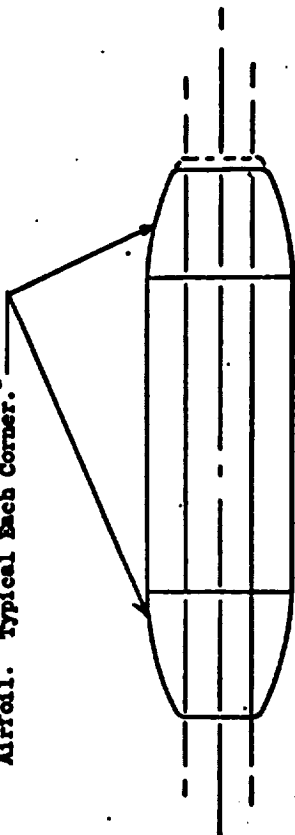
FIGURE 18. PIV - BASELINE VERTICAL TAIL (V₁) ACTS FOD

DELTA WING ORBITER
MSC
DR#1215 B-1- 401

MCDONNELL AIRCRAFT COMPANY

Notes: All dimensions are
model scale in inches.

One Half Body of Revolution
Created Through Use of NACA 633-018
Airfoil. Typical Each Corner.



MCDONNELL DOUGLAS CORPORATION

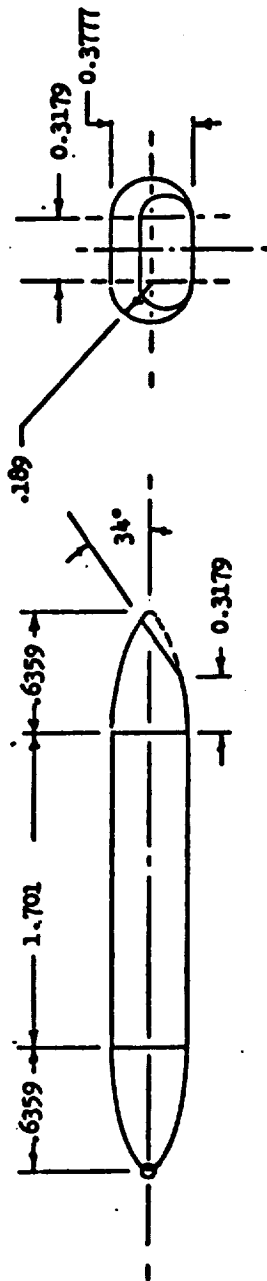
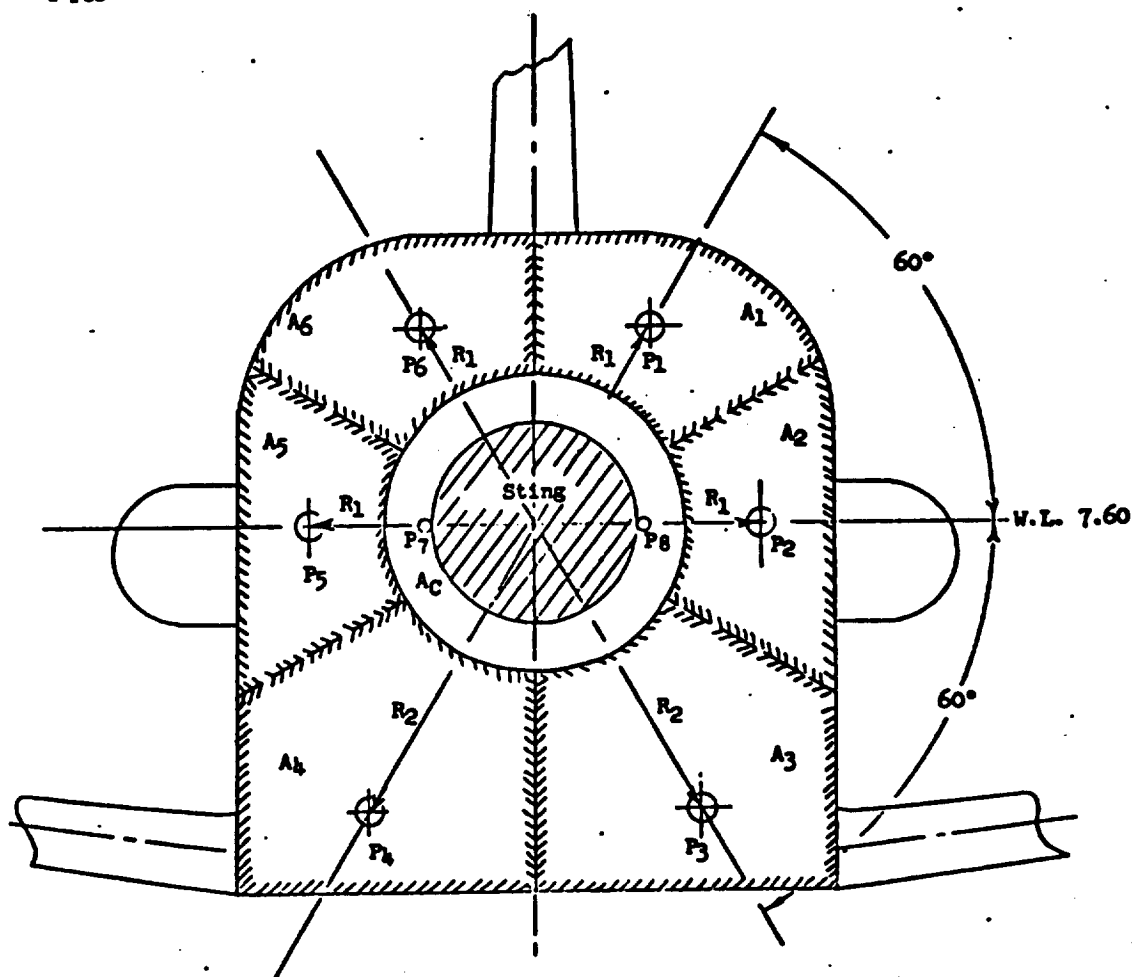


FIGURE 19. P2V - TWIN VERTICAL TAILS (V₃) ACPS PODS

**FIGURE 20. BASE AND CAVITY PRESSURE INSTRUMENTATION
AND AREA ASSIGNMENTS**

$A_1 = A_6 = 1.77 \text{ in.}^2$ Cavity Area, $A_C = 3.14 \text{ in.}^2$
 $A_2 = A_5 = 1.63 \text{ in.}^2$ $R_1 = 1.5"$
 $A_3 = A_4 = 2.72 \text{ in.}^2$ $R_2 = 2.2"$
 Total Base Area, $A_B = 12.24 \text{ in.}^2$

$$C_{AB} = \frac{1}{qS_{ref}} \left[(P_1 + P_6)A_1 + (P_2 + P_5)A_2 + (P_3 + P_4)A_3 \right] \quad C_{AC} = \frac{1}{qS_{ref}} \left[\left(\frac{P_7 + P_8}{2} \right) A_C \right] \text{ where } P_{1-8} = P_{\text{orifice}} - P_{\infty}$$



Note: View Looking Upstream

505

MCDONNELL DOUGLAS CORPORATION

TABLE II.
TEST 7398 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		No. of RUNS	MACH NUMBERS			
		a	b	Sc	So		20.3	4	3	5
R06004	040-A BASELINE	A	0	0	0	1				
03				10	T					
05				-20	T					
07				-30						
08				-10	V					
09				-10	10					
10				-30	10					
13				OFF						
14	040-A NOSE No 2			-10	D	2				
15				T		4				
16				T		3				
17				T		5				
18				V		6				
20				-30	O	4				
21				0	-30	O	5			
23				-10	O	6				
24	040-A BASELINE			-10	O	1				
25	040-A NOSE No 2			T		2				
26				T		3				
27				V		4				

ALPHA SCH. A : 18, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 55°
B : 18, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 55°

BETA CN CLM CAF CBL CYN CY CL CDF (L/D) F MACH ALPHA
COEFFICIENTS: IDPVAR(1) IDPVAR(2) IDP

TABLE II. (CONTINUED)

TEST 2398 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. OF RUNS	MACH NUMBERS									
		a	b	Sc	Sc	MOSE		20.3									
R06028	040-A NOSE NO. 5	A	25	-10	0	5	1	28									
	5							29									
	4							30									
	040-A BASELINE							31									
R06035	040-A BASELINE	B	0	0	0	1		35									
	040-A NOSE NO. 2							36									
	↓							37									
	040-A BASELINE							38									

6 of 8
SCHEDULES

507

DELTA WING ORBITER
MSC
DR#1218 B-1- 405

ORIGINAL PAGE IS
OF POOR QUALITY

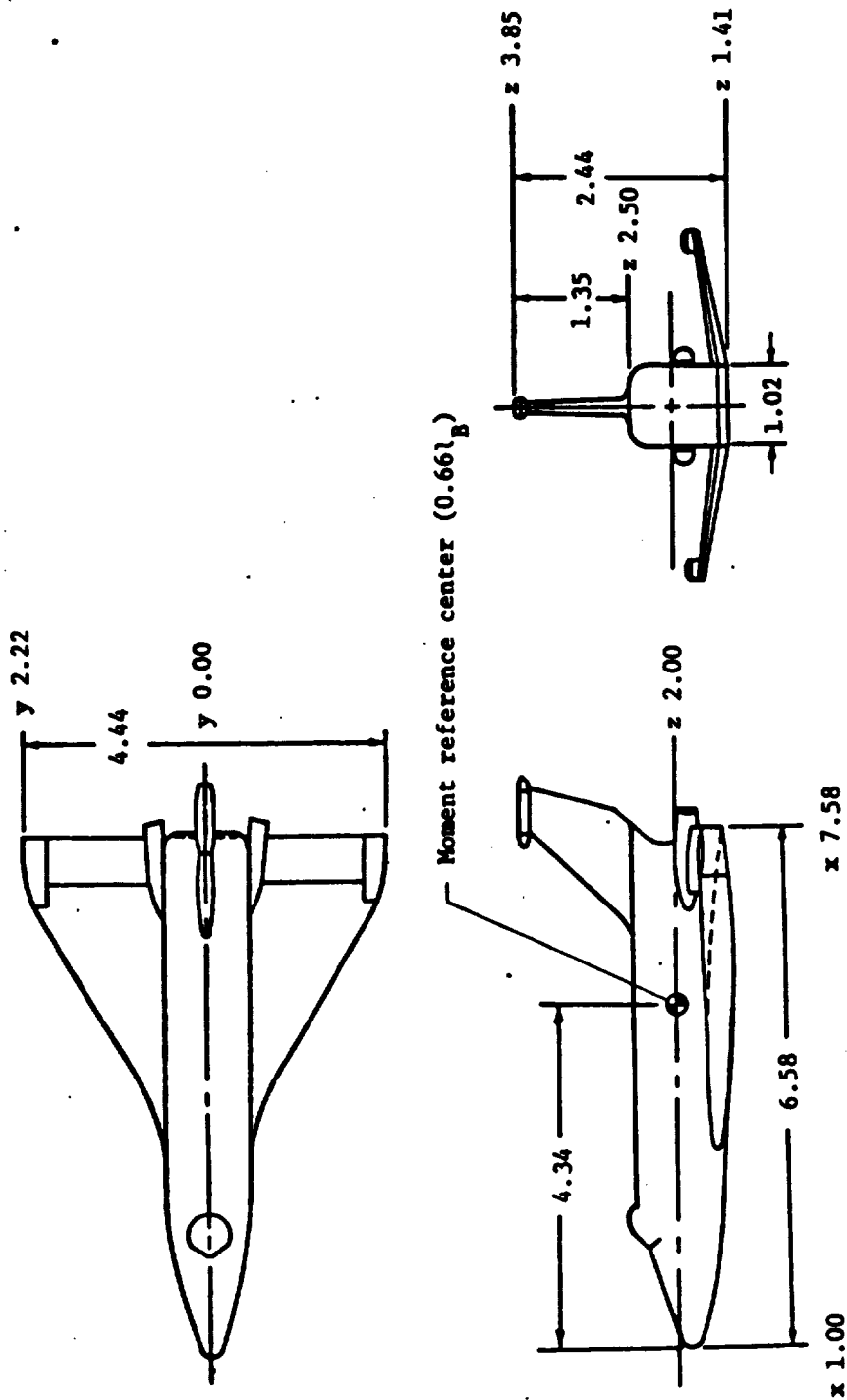


FIGURE 2. Baseline vehicle. All dimensions are model scale in inches.

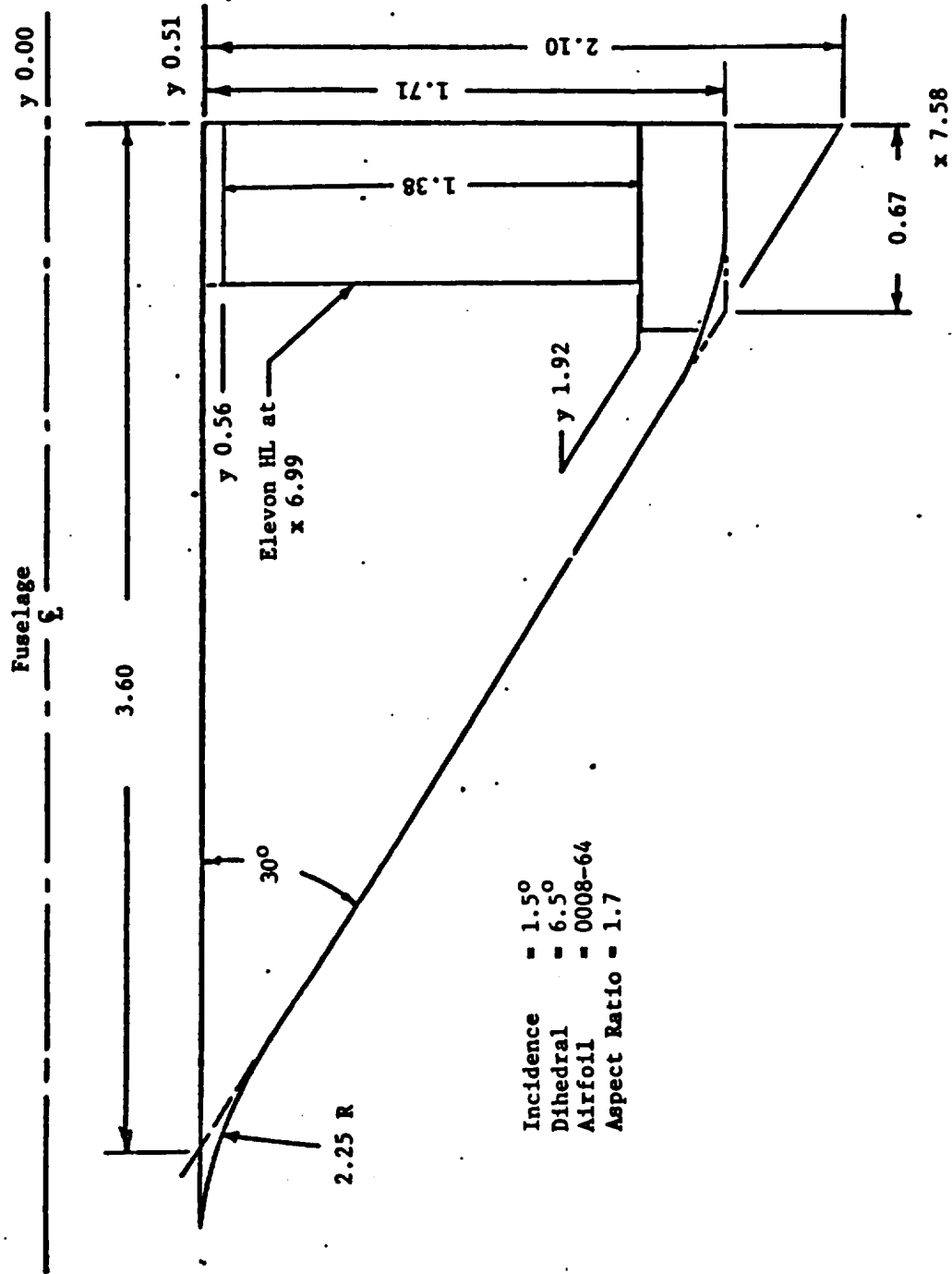


FIGURE 3. W₁ - Baseline Delta Wing and Elevons. All dimensions are model scale in inches

DELTA WING ORBITER
 MSC
 DR#1218 B-1- 407

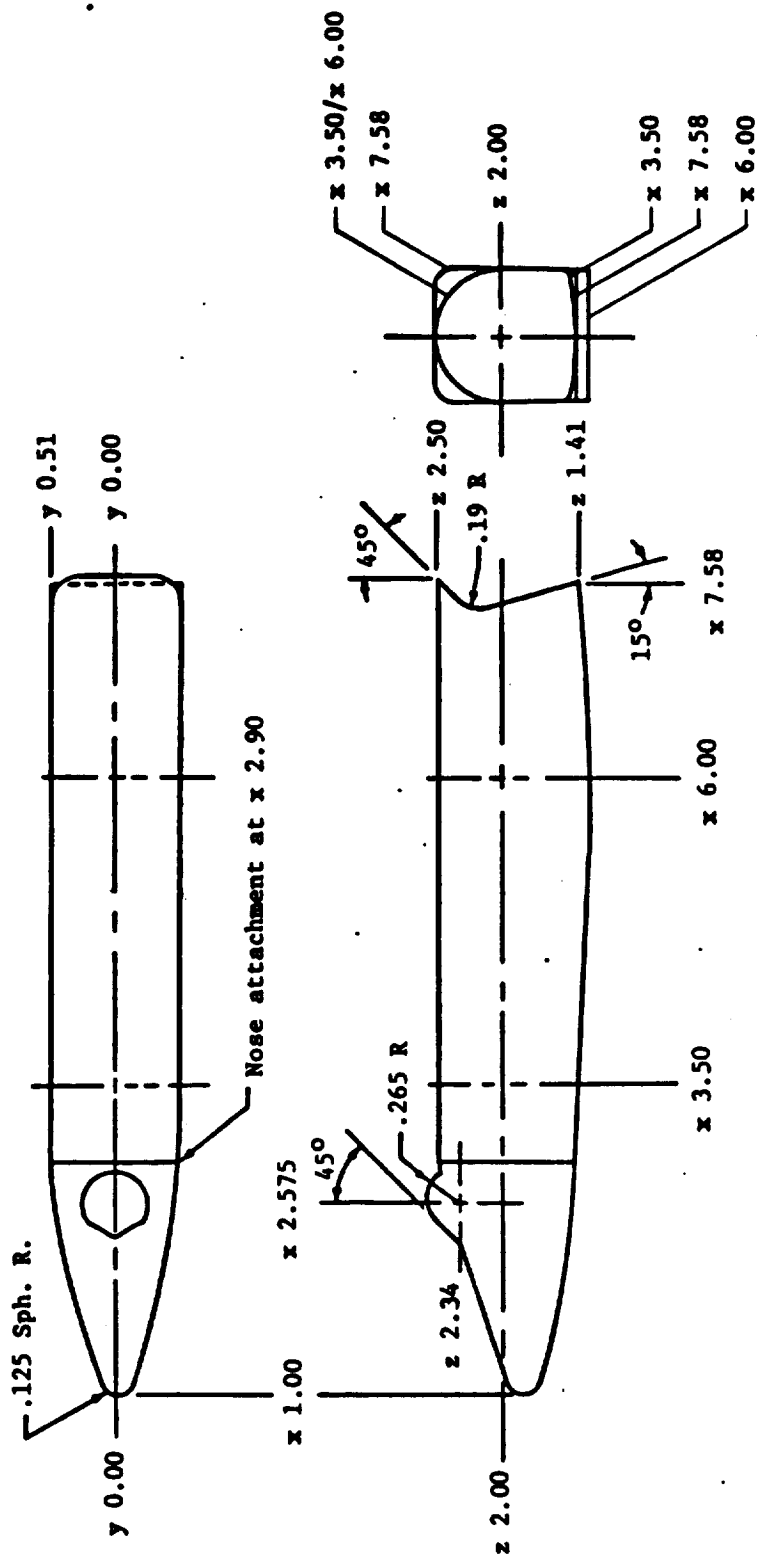


FIGURE 4. B1 - Baseline fuselage. All dimensions are model scale in inches.

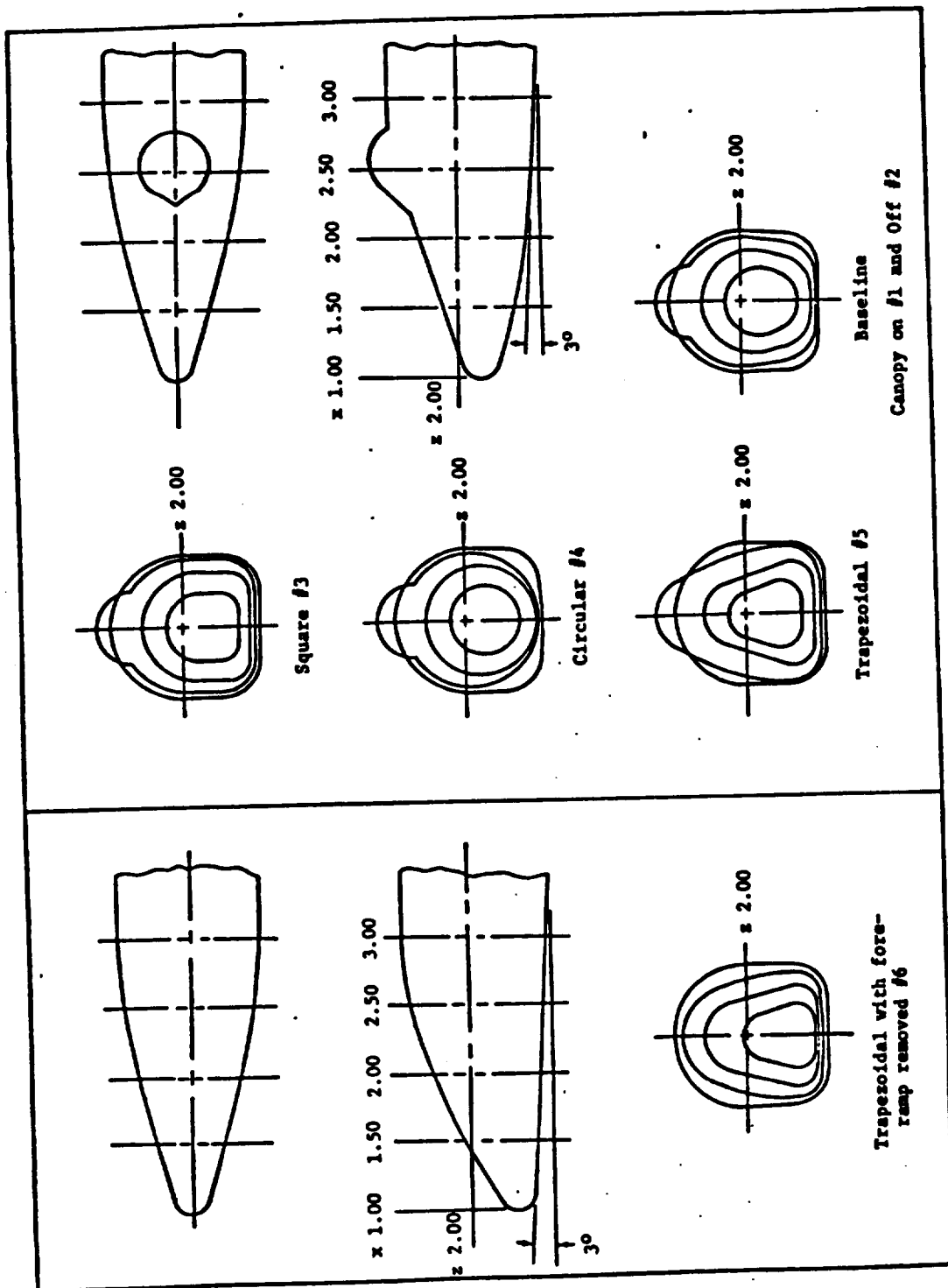


FIGURE 5. Nose shape variations. All dimensions are model scale in inches.

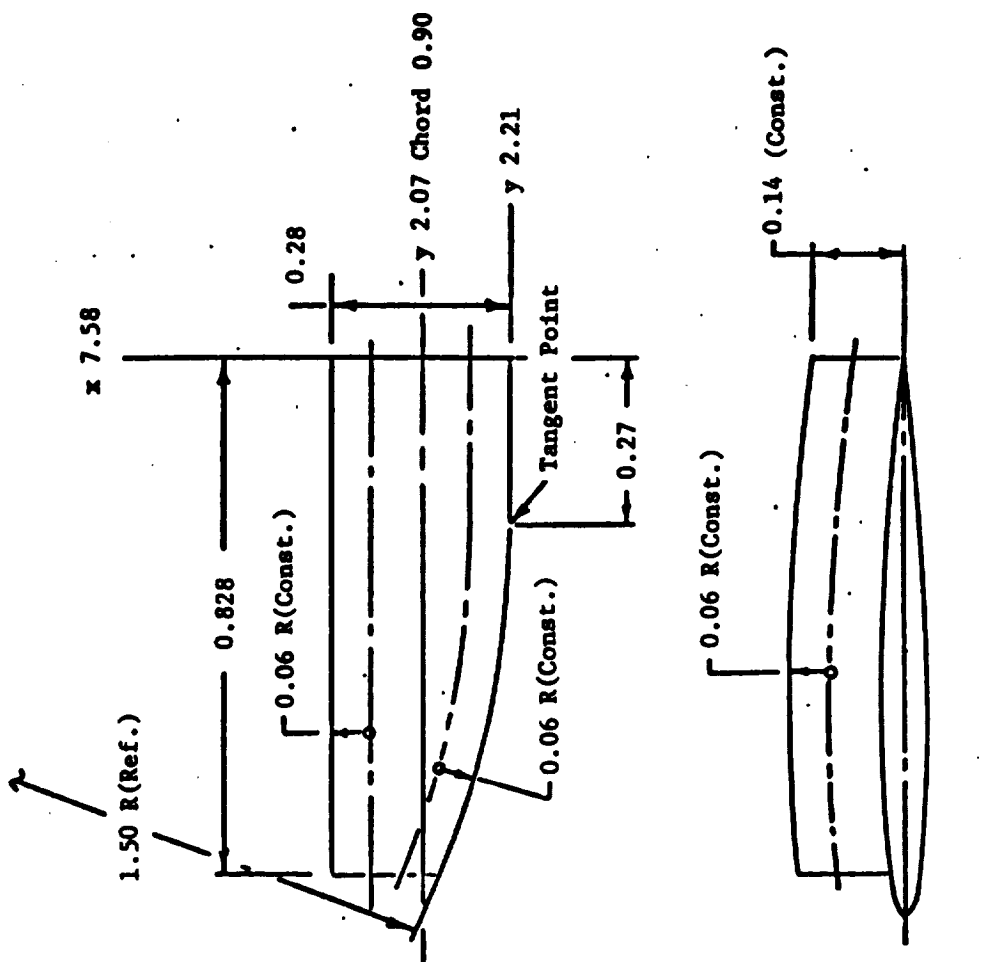


FIGURE 6. Baseline Wing (W_1) ACTS Pods. All dimensions are in model scale in inches.

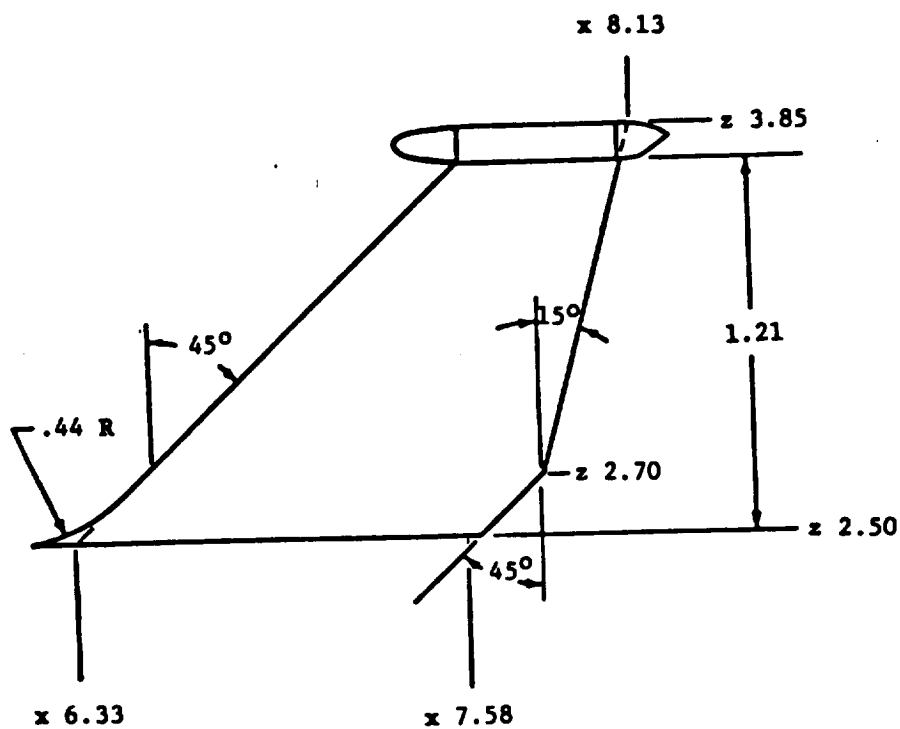


FIGURE 7. Vertical tail with RCS pod. All dimensions are model scale in inches.

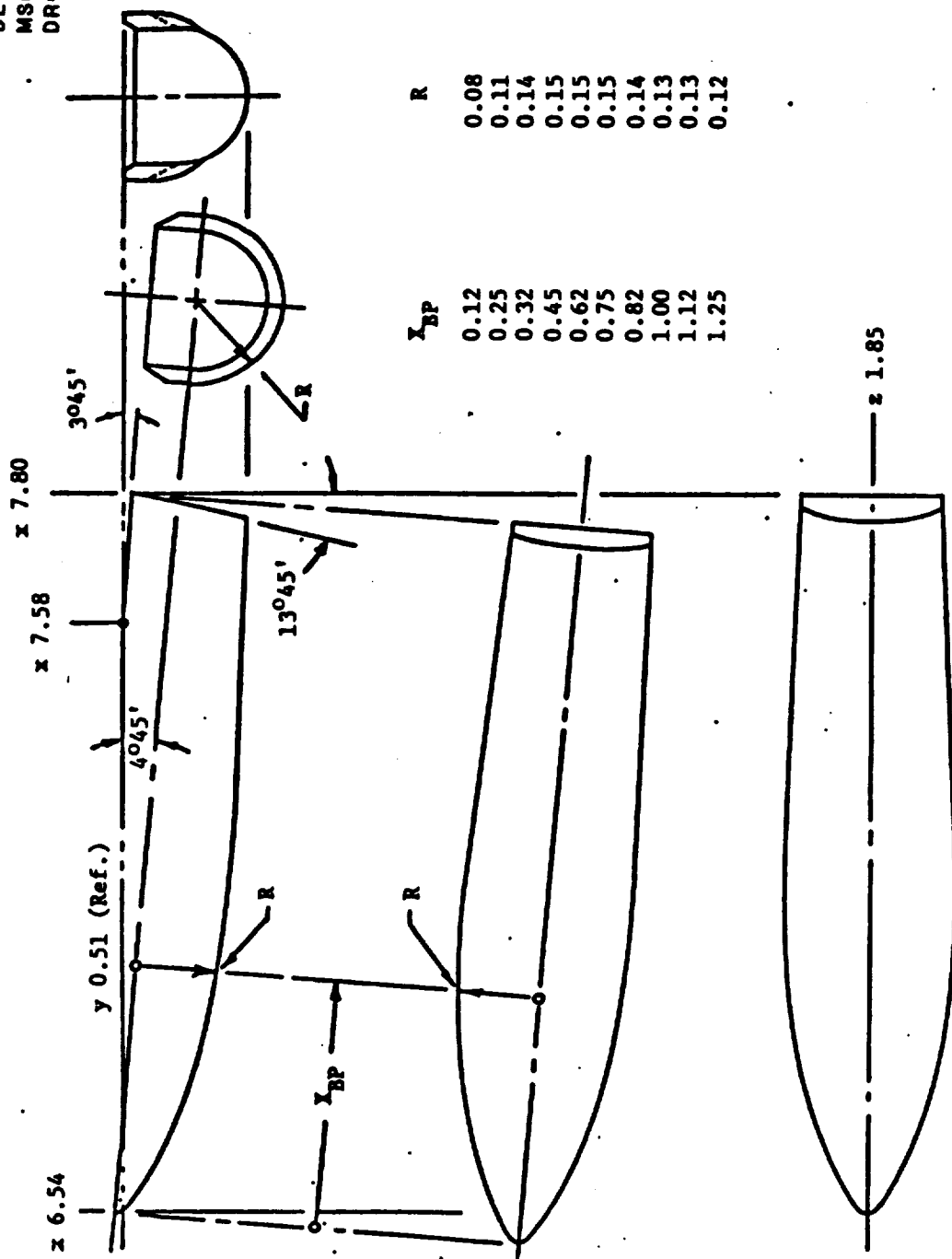
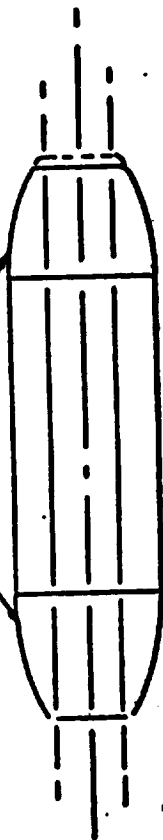


FIGURE 8. Baseline Orbital Maneuvering System (OMS) Engine Pod. All dimensions are in model scale in inches.

One Half Body of Revolution Created
Through Use of NACA 633-018 Airfoil.
Typical Each Corner.



x	y
Inches	Inches
0.01	0.02
0.04	0.04
0.09	0.05
0.14	0.06
0.20	0.06

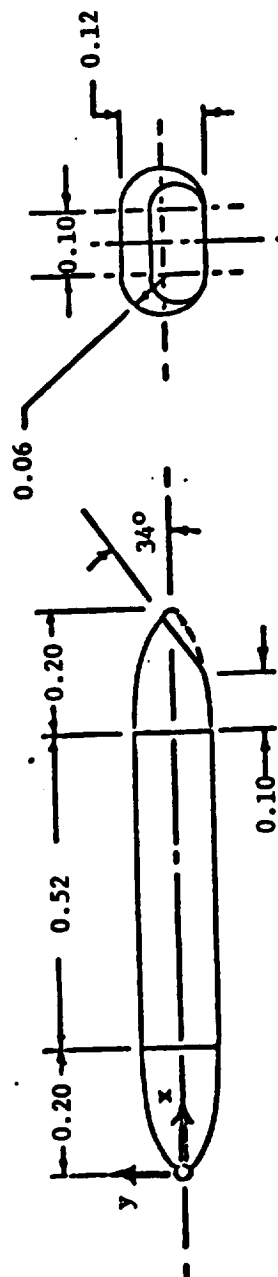


FIGURE 9. Baseline Vertical Tail ACPS Pod. All dimensions are in model scale in inches.

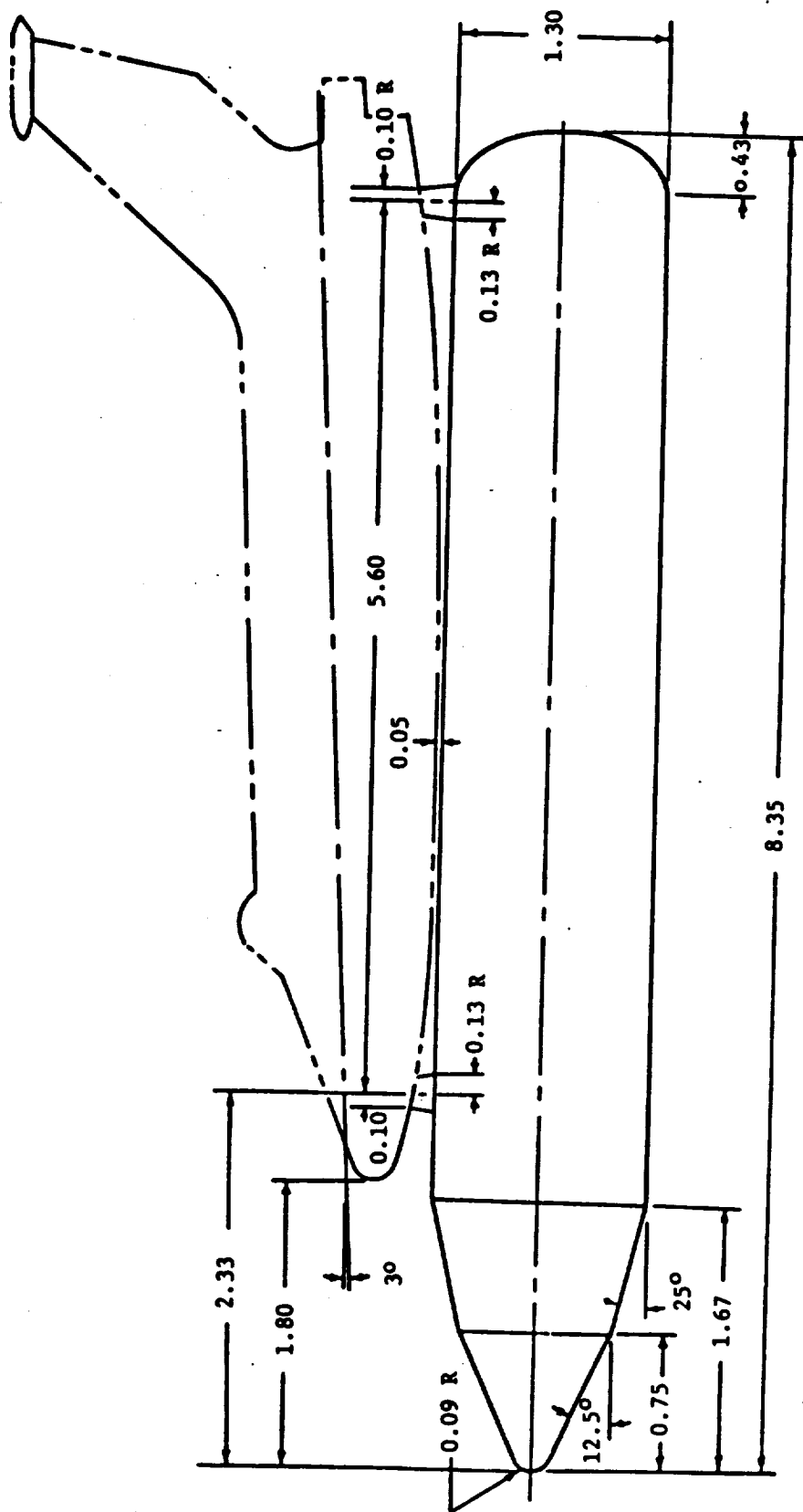


FIGURE 10. Single HO tank and orbiter arrangement. All dimensions are for model scale in inches.

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE I.
TEST LAC/CENT-80 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER		CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
			α	β	δ_{el}	δ_{er}	δ_g		10.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

1 7 13 19 25 31 37 43 49 55 61 67 7576
 BETA ICN ICA CLM COL CYN CY CL CD L/D
 COEFFICIENTS: $\alpha A = 0$ to 45° by 5°
 $\alpha B = 0$ to 40° by 5°
 SCHEDULES
 IDPVAR(1) IDPVAR(2) NDV

DELTA WING ORBITER
MSC
DR#1219 B-1- 415

TABLE I. (Continued)
TEST LRC/CFHT-80 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

TEST RUN NUMBERS																												
DATA SET IDENTIFIED	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)																				
		a	b	$\delta\alpha$	$\delta\epsilon$	$\delta\mu$		10.3	24	25	26	30	31	32	33	34	35	36	37	39.	40	41	42	43	44	45	46	47
R05121	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ W ₁ D ₁ C ₁	A	0	0	0	0	1																					
122		B	-2.5	0	0	0																						
123		B	-5	0	0	0																						
131	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	0	0	±30																						
132		B	-5	0	0	±30																						
141	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	0	0	0																						
142		B	-5	0	0	0																						
151	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	0	0	0																						
152		B	-5	0	0	0																						
161	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	-40	-40	0																						
162		B	-5	-40	-40	0																						
171	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	0	0	0																						
172		B	-5	0	0	0																						
181	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	-40	-40	0																						
191	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	0	0	0																						
192		B	-5	0	0	0																						
201	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁ D ₁ C ₁	A	0	-40	-40	0																						
211	B ₁ W ₁ ⁰⁰ V ₁ ⁰⁰ M ₁ P ₁	A	0	0	0	0																						
212		B	-2.5	0	0	0																						
213		B	-5	0	0	0																						

7 13 19 25 31 37 43 49 55 61 67 73 76

COEFFICIENTS:
a or b $\alpha A = 0$ to 45 by 5°
SCHEDULES $\alpha B = 0$ to 40 by 5°

—IDFVAR(1)—IDFVAR(2)—NDV

NASA-MSPC-MAP

PRETEST **POSTTEST**

[illegible]

SCHEDULES

DELTA WING ORBITER
 MSC
 DR#1219 B-1- 418

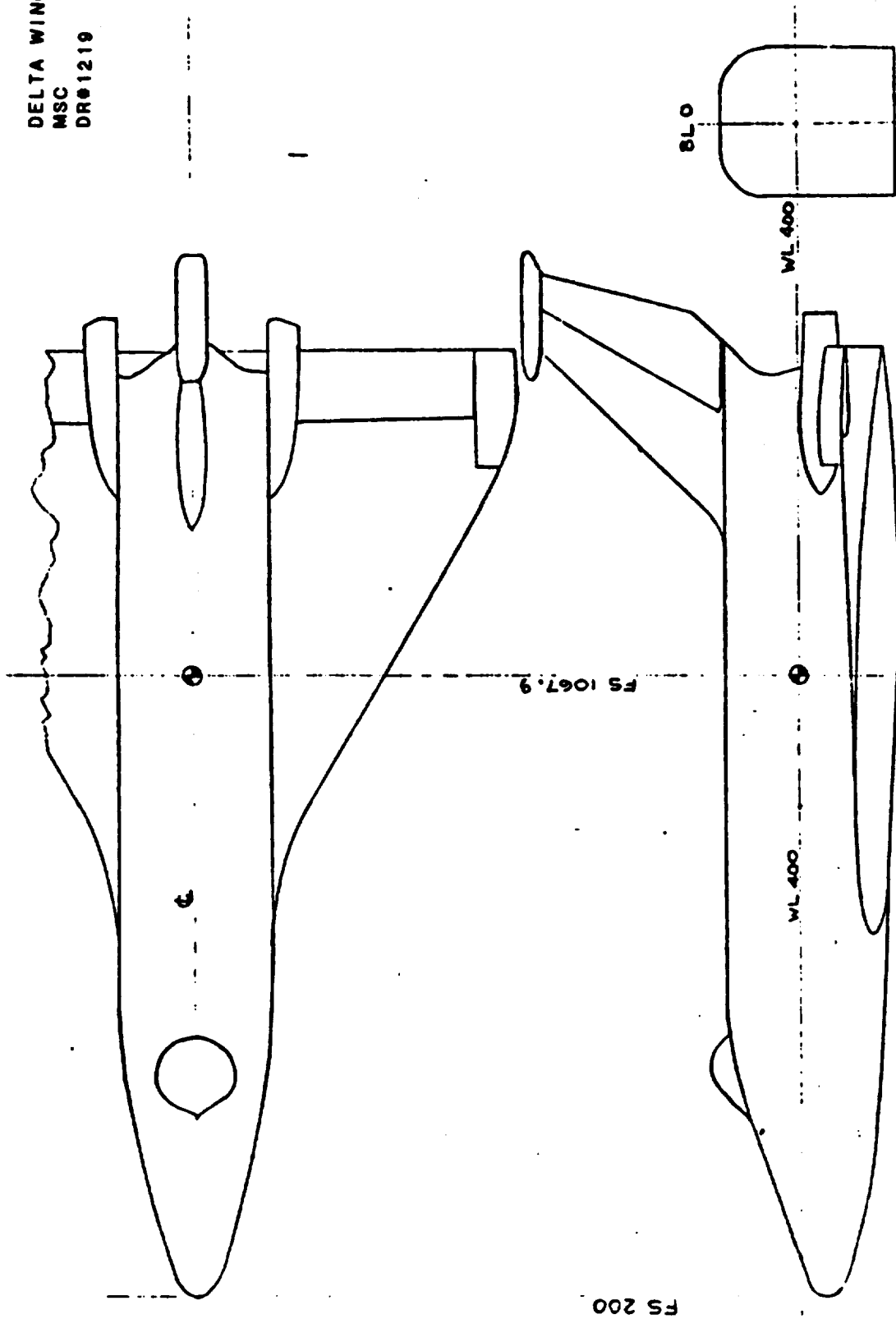
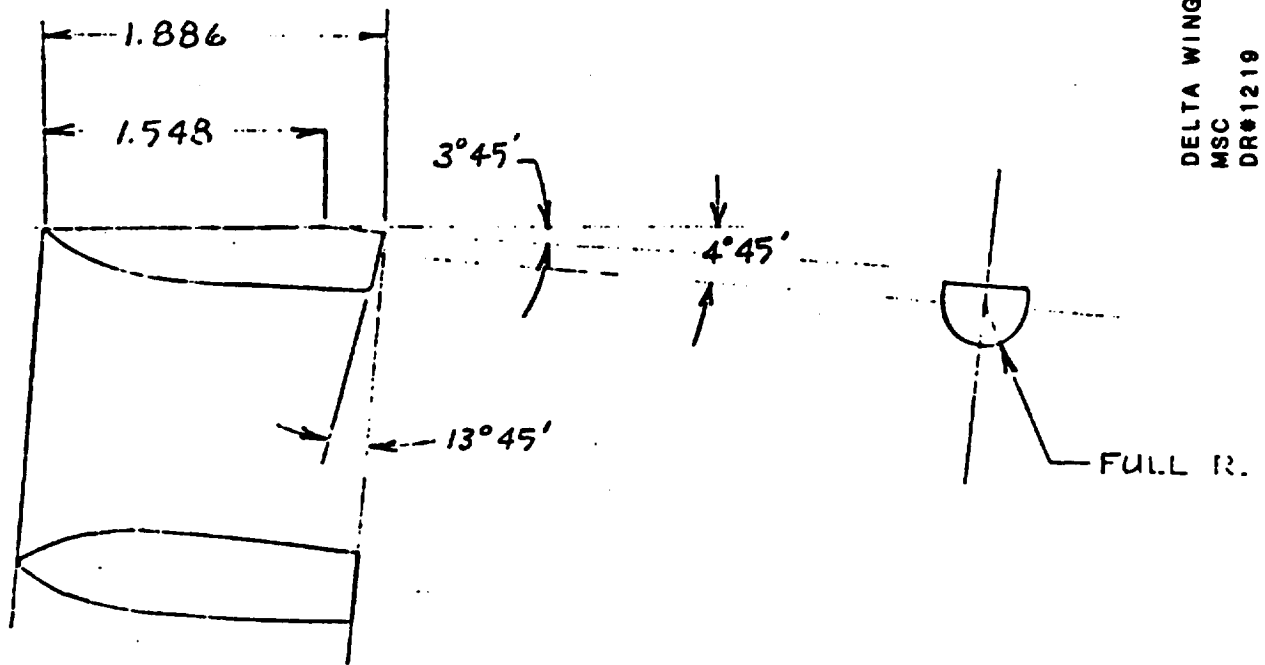


FIGURE 3. MSC 040A ORBITER



OMS PODS

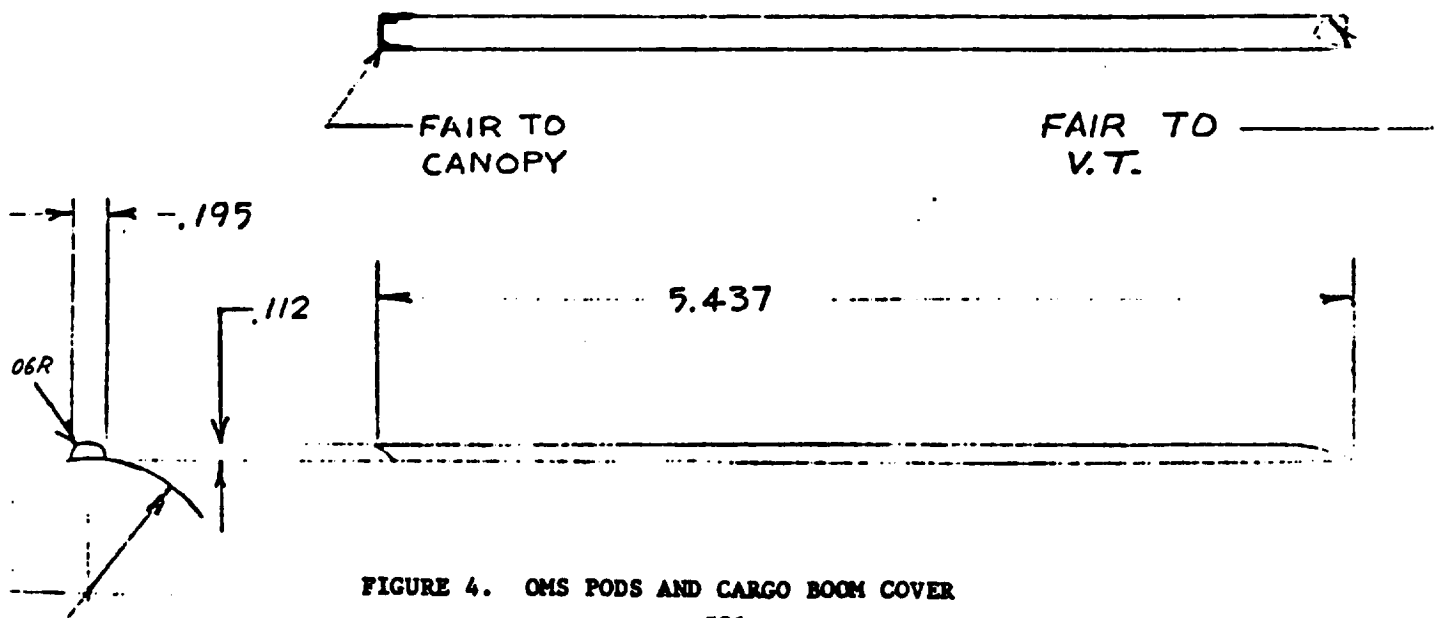


FIGURE 4. OMS PODS AND CARGO BOOM COVER

TABLE II.

TEST JPL WT20-681 DATA SET COLLATION SHEET

SHEET 1 OF 7

.0075 SCALE MODEL OF THE MSC D40A SPACE SHUTTLE
ORBITER IN THE J.P.L. 20" SUPERSONIC WIND TUNNEL

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		α	β	δ_{CL}	δ_{CE}	δ_{CF}	δ_{CD}		2.0	2.4	3.0	4.0				
R6011	B ₁ W ₁ ²⁰ V ₁ ²⁰ M ₁ P ₁ D ₁ C ₁	A	O	O	O	O	O	4	2	46	90	108				
012		A	5						3	47	91	109				
013		O	B						4	48	92	110				
014		10	B						5	49	93	111				
015		20	B						6	50	94	112				
016		30	B						7	51	95	113				
021	B ₁ W ₁ ²⁰ V ₁ ²⁰ M ₁ P ₁ D ₁ C ₁	A	O	-40	-40	O	O		8	61	75	122				
022		A	5						9	62	76	123				
023		O	B						10	63	77	124				
024		10	B						11	64	78	125				
025		20	B						12	65	79	126				
026		30	B						13	66	80	127				
031	B ₁ W ₁ ²⁰ V ₁ ²⁰ M ₁ P ₁ D ₁ C ₁	A	O	-20	-40	O	O		14	60	81	128				
041	B ₁ W ₁ ²⁰ V ₁ ²⁰ M ₁ P ₁ D ₁ C ₁	A	O	-20	-20	O	O		15	74	82	116				
042		A	5						16	55	83	117				
043		O	B						17	56	84	118				
044		10	B						18	57	85	119				
045		20	B						19	58	86	120				
046		30	B						20	59	87	121				

CN	7	13	19	25	31	37	43	49	55	61	67	73
CLM	CY	CYN	KBL	CAB	CA							
COEFFICIENTS:												
α or β	$\alpha A = 0^\circ \rightarrow 30^\circ$ by 2°											
SCHEDULES	$\beta B = \pm 4^\circ, \pm 3^\circ, \pm 2^\circ, \pm 1^\circ, 0^\circ, 6^\circ, 10^\circ$											
	IDPVAR(1) IDPVAR(2) IDPVAR(3)											

NASA-MSC-MAP

TABLE II. (CONTINUED)

TEST JPL WT20-681 DATA SET COLLATION SHEET

SHEET 2 OF 7

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)					
		α	β	δ_{CL}	δ_{CR}	δ_{L}	δ_{R}		2.0	2.4	3.0	4.0		
RGB051	$B, W_1^{1.0} V_1^{1.0} M, P, D, C_1$	A	0	0	0	-20	0	0	21	52	88	114		
052	γ	A	5	γ	γ	γ	γ	γ	22	93	89	115		
061	$B, W_1^{1.0} V_1^{1.0} M, P, D, C_1$	A	0	-30	0	0	0	0	23	67	74	129		
071	$B, W_1^{1.0} V_1^{1.0} M, P, D, C_1$	A	0	-10	0	0	0	0	24	68	73	130		
081	$B, W_1^{1.0} V_1^{1.0} M, P, D, C_1$	A	0	+10	0	0	0	0	25	69	72	131		
091	$B, W_1^{1.0} V_1^{1.0} M, P, D, C_1$	A	0	+10	0	0	0	γ	26	70	71	132		
101	$B, W_1^{1.0} V_1^{1.0} M, P, D, C_1$	A	0	0	0	0	0	3	28		414	416		
102		A	5					3	29		415	417		
103		0	B					1	30					
104		10	B					1	31					
105		20	B					1	32					
106	γ	30	B	γ	γ	γ	γ	1	33					
111	$B, W_1^{1.0} V_1^{1.0} M, P, D, C_1$	A	0	0	0	0	0	4	34	40	96	102		
112		A	5						35	41	97	103		
113		0	B						36	42	98	104		
114		10	B						37	43	99	105		
115		20	B						38	44	100	106		
116	γ	30	B	γ	γ	γ	γ	γ	39	45	101	107		

1	7	13	19	25	31	37	43	49	55	61	67	73	79
COEFFICIENTS:													IDFVAR(1) IDFVAR(2) IDV
α or β													
SCHEDULES													

DELTA WING ORBITER
MSC
DR#1221 B-1- 421

TABLE II. (CONTINUED)

TEST JPL WT20-681 DATA SET COLLATION SHEET

SHEET 3 OF 7

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)					
		a	B	δ_{CL}	δ_{EP}	δ_{EL}	δ_{EE}		2.0	2.4	3.0	4.0		
RGB121	$B, W_1^{**}, V_1^{**}, M, P, D, C_1$	A	O	-40	-40	± 30	O	3						
122		A	5						314	320	133			
123		O	B						315	321	134			
124		O	B						316	322	135			
125		O	B						317	323	136			
126		O	B						318	324	137			
131	$B, W_1^{**}, V_1^{**}, M, P, D, C_1$	A	O	O	O	± 20	O		319	325	138			
132		A	5						312	326	139			
141	$B, W_1^{**}, V_1^{**}, M, P, D, C_1$	A	O	O	O	± 10	O		313	327	140			
142		A	5						310	328	141			
151	$B, W_1^{**}, V_1^{**}, M, P, D, C_1$	O	B	O	O	O	O		311	329	142			
152		O	B						306	331	143			
153		O	B						307	332	144			
154		O	B						308	333	145			
161	$B, W_1^{**}, V_1^{**}, M, P, D, C_1$	A	O	O	O	± 30	O		309	334	146			
162		A	5						299	335	147			
163		O	B						300	336	148			
164		O	B						301	337	149			
165		O	B						302	338	150			
166		O	B						303	339	151			
		O	B						304	340	152			

1	7	13	19	25	31	37	43	49	55	61	67	73	79
COEFFICIENTS:													
a or B													
SCHEDULES													
IDFVAR(1) IDFVAR(2) NDV													

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE II. (CONTINUED)

TEST JPL WT20-681 DATA SET COLLATION SHEET

SHEET 4 OF 7

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						
		α	β	δ_{CL}	δ_{CR}	δ_e	δ_{SE}		2.0	2.4	3.0	4.0			
R6B 171	B ₁ W ₁ ⁹⁰ V ₁ ¹³⁰ M ₁ D ₁ C ₁	A	O	O	O	O	O	3		293	341	153			
172		A	S							294	342	154			
173		O	B							295	343	155			
174		10	B							296	344	156			
175		20	B							297	345	157			
176	V	30	B							298	346	158			
181	B ₂ W ₁ ⁹⁰ V ₁ ¹³⁰ M ₁ P ₁ D ₁ C ₁	A	O	O	O	O	O			287	347	159			
182		A	S							288	348	160			
183		O	B							289	349	161			
184		10	B							290	350	162			
185		20	B							291	351	163			
186	V	30	B							292	352	164			
191	B ₂ W ₂ ⁹⁰ V ₂ ¹³⁰ M ₁ P ₁ D ₁ C ₁	A	O	O	O	O	O			281	353	165			
192		A	S							282	354	166			
193		O	B							283	355	167			
194		10	B							284	356	168			
195		20	B							285	357	169			
196	V	30	B							286	358	170			

1	7	13	19	25	31	37	43	49	55	61	67	73	79
IDFVAR(1) IDFVAR(2) IDFVAR(3) IDFVAR(4)													

COEFFICIENTS:

α OF β
SCHEDULES

DELTA WING ORBITER
MSC
DR#1221 B-1- 423

TABLE II. (CONTINUED)

TEST JPL WT20-681 DATA SET COLLATION SHEET

SHEET 5 OF 7

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)					
		α	β	δ_{CL}	δ_{CA}	δ_{CZ}	δ_{CS}		2.0	2.4	3.0	4.0		
RGB 201	$B_2 W_1^{100} V_1^{100} M_1 P_1 D_1 C_1$	A	O	-40	-40	O	O	3		275	359	171		
202		A	5							276	360	172		
203		O	B							277	361	173		
204		10	B							278	362	174		
205		20	B							279	363	175		
206		30	B							280	364	176		
211	$B_2 W_1^{100} V_1^{100} M_1 P_1 D_1 C_1$	A	O	O	O	O	O			269	365	177		
212		A	5							270	366	178		
213		O	B							271	367	179		
214		10	B							272	368	180		
215		20	B							273	369	181		
216		30	B							274	370	182		
221	$B_1 W_1^{100} V_1^{100} M_1 P_1$	A	O	O	O	O	O			261	373	183		
222		A	5							262	374	184		
223		O	B							263	375	185		
224		10	B							264	376	186		
225		20	B							265	377	187		
226		30	B							266	378	188		
231	$B_1 W_1^{100} V_1^{100} M_1 P_1$	A	O	O	O	O	O			267	371	189		
232		A	5							268	372	190		

COEFFICIENTS:
 α or β
SCHEDULES

1 7 13 19 25 31 37 43 49 55 61 67 73 75

— IDPVAR(1) IDPVAR(2) INDV

NASA-MSC-MAP

TABLE II. (CONTINUED)
TEST JPL WT 20-681 DATA SET COLLATION SHEET

SHEET 6 OF 7

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						
		α	β	δ_{CL}	δ_{CE}	δ_{CF}	δ_{CF}		2.0	2.4	3.0	4.0			
RGB241	B, W ¹⁰⁰ M, P, D, C ₁	A	O	O	O	OFF	O	3		255	379	191			
242		A	5							256	380	192			
243		O	B							257	381	193			
244		10	B							258	382	194			
245		20	B							259	383	195			
246		30	B							260	384	196			
251	B, W ¹⁰⁰ V, M, P, D, C ₁ , F ₁	A	O	O	O	O	O			249	385	197			
252		A	5							250	386	198			
253		O	B							251	387	199			
254		10	B							252	388	200			
255		20	B							253	389	201			
256		30	B							254	390	202			
261	B, W ¹⁰⁰ V, M, P, D, C ₁ , F ₁	A	O	-40	-40	O	O			243	391	203			
262		A	5							244	392	204			
263		O	B							245	393	205			
264		10	B							246	394	206			
265		20	B							247	395	207			
266		30	B							248	396	208			
271	B, W ¹⁰⁰ V, M, P, D, C ₁ , F ₁	A	O	O	O	O	+10			242	397	209			
281	B, W ¹⁰⁰ V, M, P, D, C ₁ , F ₁	A	O	O	O	O	-15			241	398	210			
									37	43	49	55	61	67	75

COEFFICIENTS:
 α or β
SCHEDULES

DELTA WING ORBITER
MSC
DR#1221 B-1- 425

TABLE II. (CONTINUED)

TEST JPL WT20-681 DATA SET COLLATION SHEET

SHEET 7 OF 7

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIED	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						
		α	β	δ_{cl}	δ_{cr}	δ_r	δ_{θ}		2.0	2.4	3.0	4.0			
RG-B 291	B ₁ W ₀ [*] Y ₁ M ₁ P ₁ D ₁ C ₁	A	O	O	O	O	OFF	3		240	399	211			
301	B ₁ M ₁ D ₁ C ₁	A	O	OFF	OFF	OFF	O			234	400	212			
302		A	S							235	401	213			
303		O	B							236	402	214			
304		10	B							237	403	215			
305		20	B							238	404	216			
306		30	B	Y	Y	Y	Y			239	405	217			
311	B ₂ M ₁ D ₁ C ₁	A	O	OFF	OFF	OFF	O			228	406	218			
312		A	S							229	407	219			
313		O	B							230	408	220			
314		10	B							231	409	221			
315		20	B							232	410	222			
316		30	B	Y	Y	Y	Y			233	411	223			
321	B ₁ M ₁	A	O	OFF	OFF	OFF	O			226	412	224			
Y 322		A	S	Y	Y	Y	Y	Y		227	413	225			

1	7	13	19	25	31	37	43	49	55	61	67	73	75
COEFFICIENTS:													
α OF β													
SCHEDULES													
IDPVAR(1) IDPVAR(2) IDV													

NASA-SPC-44P

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER
MSC
DR#1221 B-1- 427

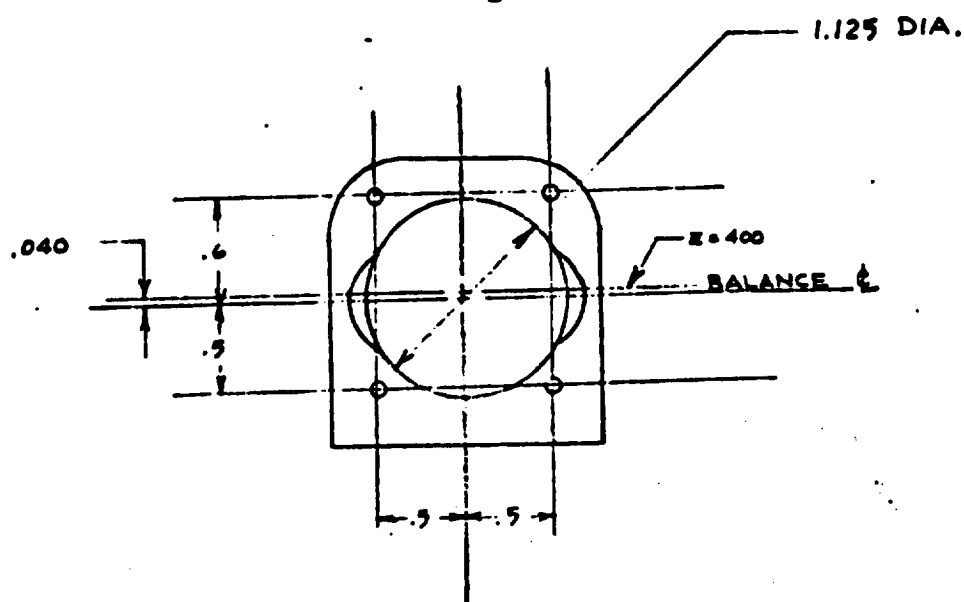


FIGURE 2. BASE PRESSURE TAP LOCATIONS

DELTA WING ORBITER
MSC
DR#1221 8-1- 428

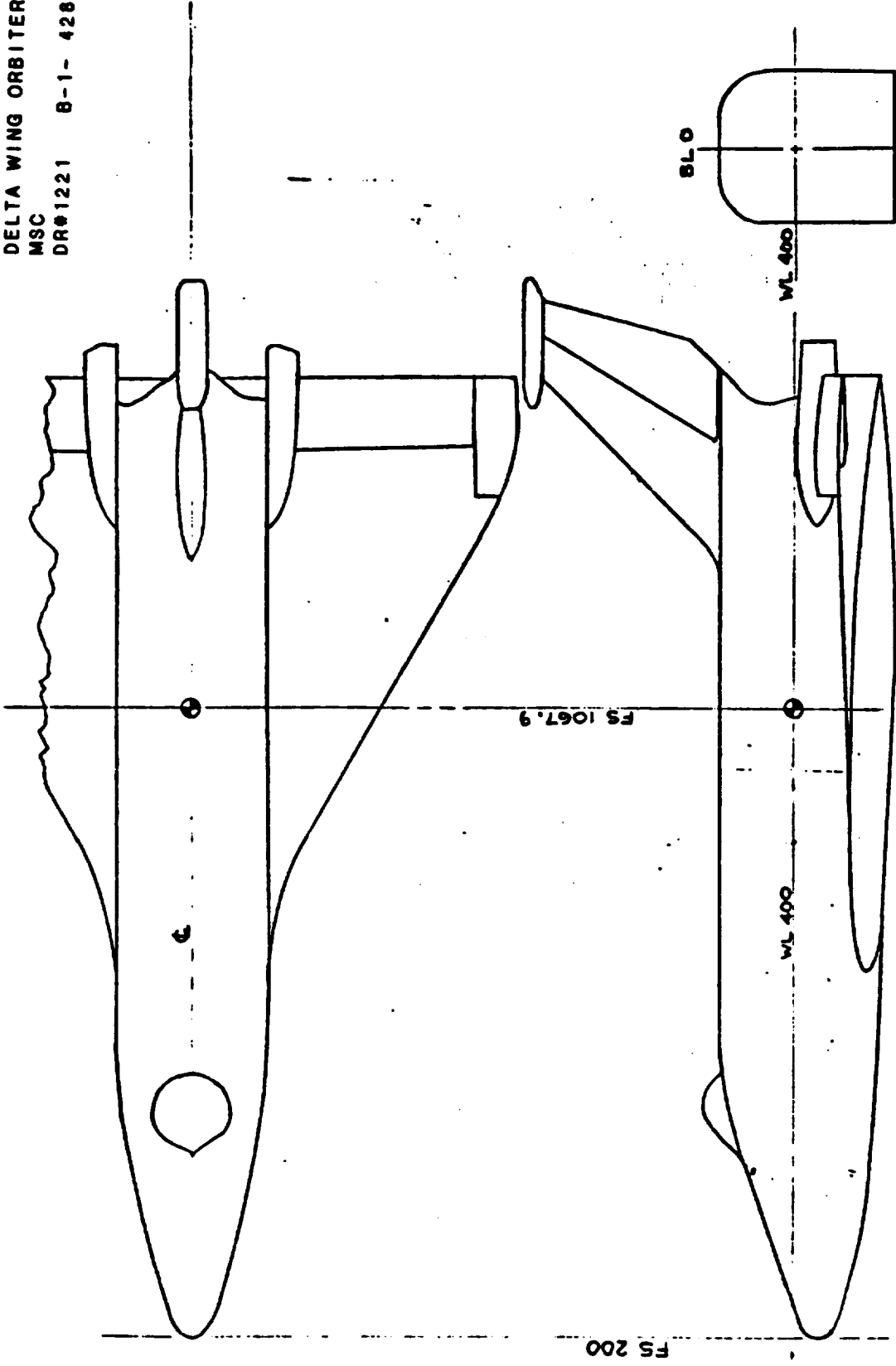


FIGURE 6. MSC 040A

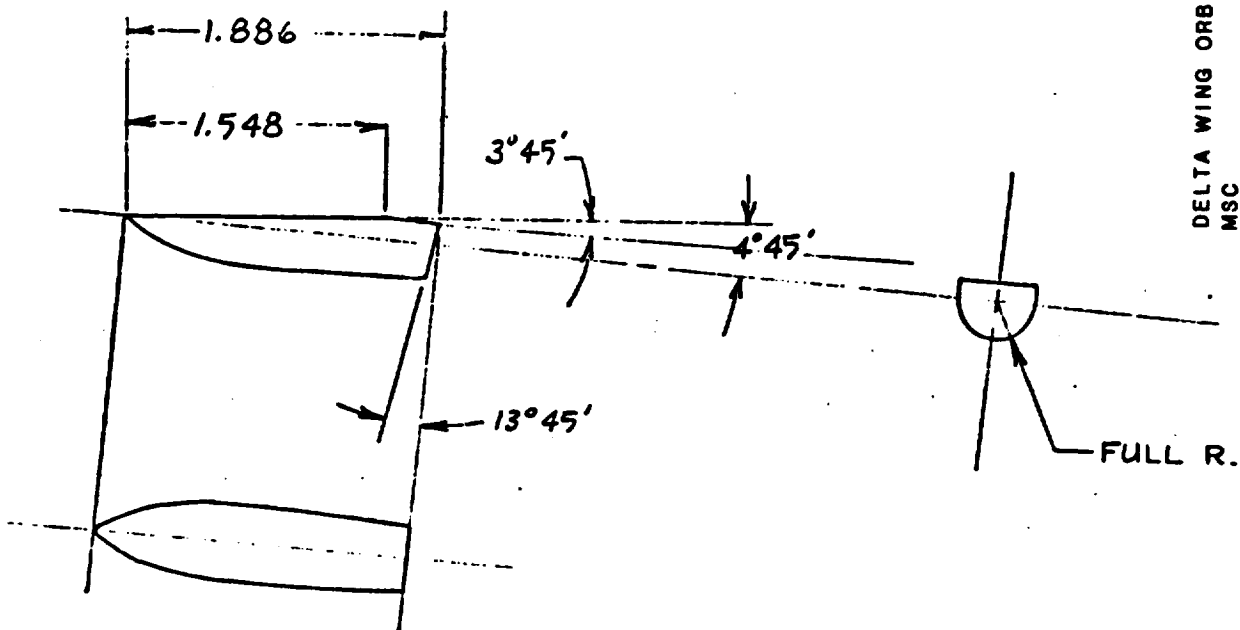


FIGURE 7. OMS PODS

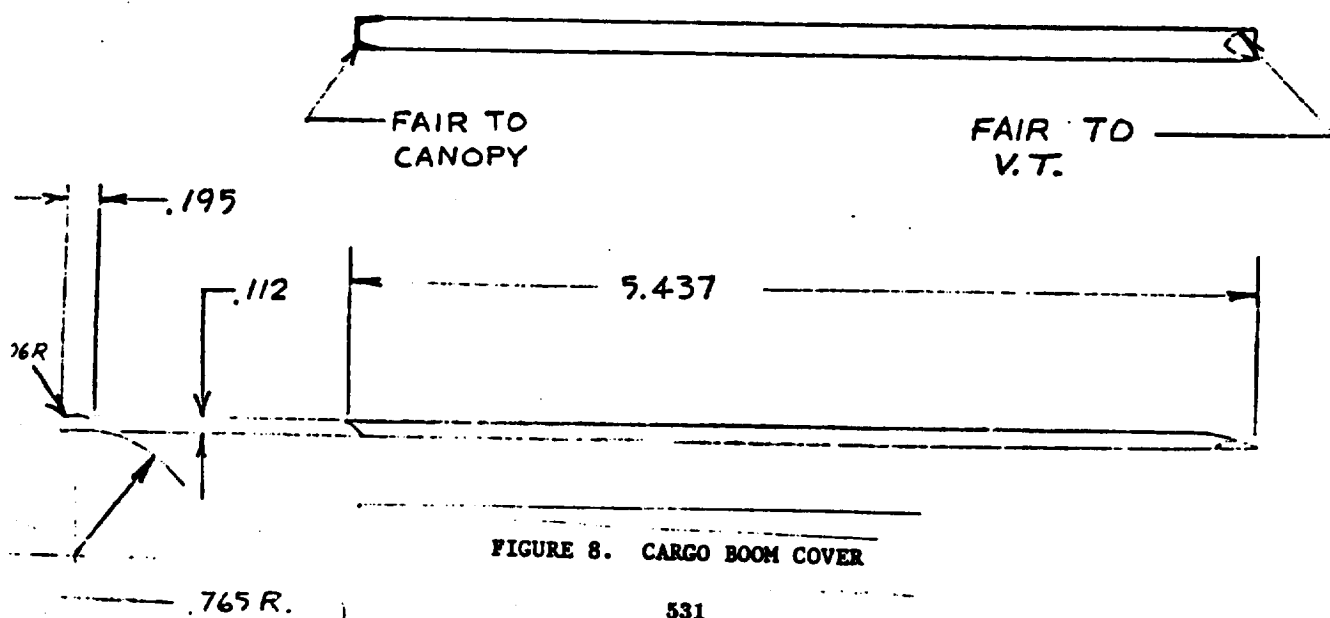


FIGURE 8. CARGO BOOM COVER

TABLE I

TEST MSC TMT 526 DATA SET COLLATION SHEET

PAGE 1 OF 4

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		a	B	SPRU	SPRS	SPSL	SPNTE		Se	0.6	0.9	1.2	1.9	3.0	4.0	4.9
E2001	B,C,N,V,P,M ₁	A	0	0	0	0	0	4	0	77%	78%	71%				61%
002	B,C,H,V,P ₁	0	C					3		83%	84%	85%				
003		10	C					4		82%	81%	80%			62%	
004		20	C					4		88%	87%	84%			63%	
005		24	C					1							64%	
006	B,C,N,V,P ₁	A	0					7		100%	99%	98%	152%	39%	37%	38%
007		B	0					4					153%	46%	41%	42%
008		0	C					4		99%	93%	92%	156%			
009		10	C					5		95%	96%	97%	155%		45%	
010		20	C					5		89%	79%	91%	154%		44%	
011		24	C					1							43%	
012		A	0	30-30				5				104%	162%	58%	59%	60%
013		B	0					4					161%	57%	56%	55%
014		0	C					2				104%	151%			
015		10	C					5				100%	159%	47%	46%	48%
016		20	C					5				101%	158%	51%	50%	49%
017		24	C					3						52%	53%	54%
018		A	0					2					164%		207%	
019		B	0					2					165%		210%	
020		A	0					2					167%		212%	

CLM F.N. CY ICEL ICYN CA CAB ICAC ICDC IDPVAR(1) IDPVAR(2) INDV

COEFFICIENTS:
a or B
SCHEDULES
A: $\alpha = 0$ TO 20°
B: $\alpha = 20^\circ$ TO 34°
C: $\beta = -4^\circ$ TO 10°

NASA-MSC-MAF

TABLE I
(Continued)

TEST 155C TWT 528 DATA SET COLLATION SHEET

PAGE 2 OF 4

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACE NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		a	b	S	FRL	STE	Surf	Surf	Se	0.6	0.9	1.2	1.9%	3.0	4.0	4.9%
021	B, C, W, V, P	B	0	0	30	30	60	60	2	-40			144%		211%	
022		A	0				0	0	2				168%		213%	
023		B	0						2				169%		214%	
024		A	0				60		2	0			143%		208%	
025		B	0						2				162%		207%	
026	B, C, W, V, P, P, W	A	0	0	0	0	0	0	5		101%	143%	151%		215%	
027	B, C, W, P, W	A	0	-	-	-	-	-	7		141%	140%	188%	201%	205%	208%
028		B	0	-	-	-	-	-	4				159%	204%	204%	
029		0	C	-	-	-	-	-	4		151%	139%	184%			
030		10	C	-	-	-	-	-	7		134%	137%	187%	200%	199%	194%
031		20	C	-	-	-	-	-	7		135%	134%	185%	194%	193%	192%
032		24	C	-	-	-	-	-	3				145%	194%	197%	

COEFFICIENTS:

a or b

SCHENILES

IDPVAR(1) IDPVAR(2) IDV

DELTA WING ORBITER
MSC
DR#1243 B-1- 431

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE I
(Continued)
TEST NSFC TWT 520 DATA SET COLLATION SHEET

PAGE 3 OF 4

PRETEST
POSTTEST

Two Vertical Rows

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES of				MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		a	b	SE	OPT	SE	FL	Se	0.6	0.9	1.2	1.9	3.0	4.0	4.2
033	B ₁ C ₄ K ₁ V ₃ P _{1N}	A	0	0	0	0	0	0	15%	15%	12%	11%		3%	
034		0	C												
035		10	C												
036		20	C												
037	B ₁ C ₄ K ₁ V ₃ P _{1N} P _{2V}	A	0						7%	75%	74%	11%	3%	2%	1%
038		B	0											5%	6%
039		0	C						7%	63%	69%	113%			
040		10	C						71%	75%	75%	172%	15%	14%	13%
041		20	C						65%	66%	67%	174%	10%	11%	12%
042		24	C										9%	8%	7%
043		A	0	10	10				114%	115%					
044		0	C						110%	111%					
045		10	C						113%	112%					
046		20	C						109%	109%					
047		A	0	60	60							169%	28%	29%	30%
048		B	0									179%	27%	26%	25%
049		0	C									177%			
050		10	C									176%	16%	17%	18%
051		20	C									175%	21%	20%	19%
052		24	C									174%	22%	23%	24%

COEFFICIENTS:
a of B
SCHEDULES

1DPVAR(1) 1DPVAR(2) INDV

NASA-NSFC-MAP

TABLE I
(Concluded)

TEST MSFC TWI 522 DATA SET COLLATION SHEET

PAGE 4 OF 4

☐ PRETEST
☒ POSTTEST

TWIN VERTICAL RUNS

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES OF				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						
		A	B	SFCL	SEFF	SWFL	SWFE		Se	0.6	0.9	1.2	1.6	3.0	4.0
053	B, C ₄ W ₁ V ₃ P _W R _V	A	0	30	30	0	0	3	0			122%	151%	196	31%
054		B	0					2					182%	182%	32%
055		10	C					2				121%	183%		
056		20	C					3				129%	184%		
057		34	C					1						34%	
058	B, C ₄ W ₁ V ₄ P ₁	0	C	0	0			3		142%	143%	144%		33%	
059		10	C					3		147%	144%	145%			
060	B, C ₄ W ₁ V ₇ R _V P _W	10	C					3		148%	149%	159%			

7	13	19	25	31	37	43	49	55	61	67	73	79
---	----	----	----	----	----	----	----	----	----	----	----	----

COEFFICIENTS:

a or b

SCHEDULES

→ IDPVAR(1) IDPVAR(2) INDV

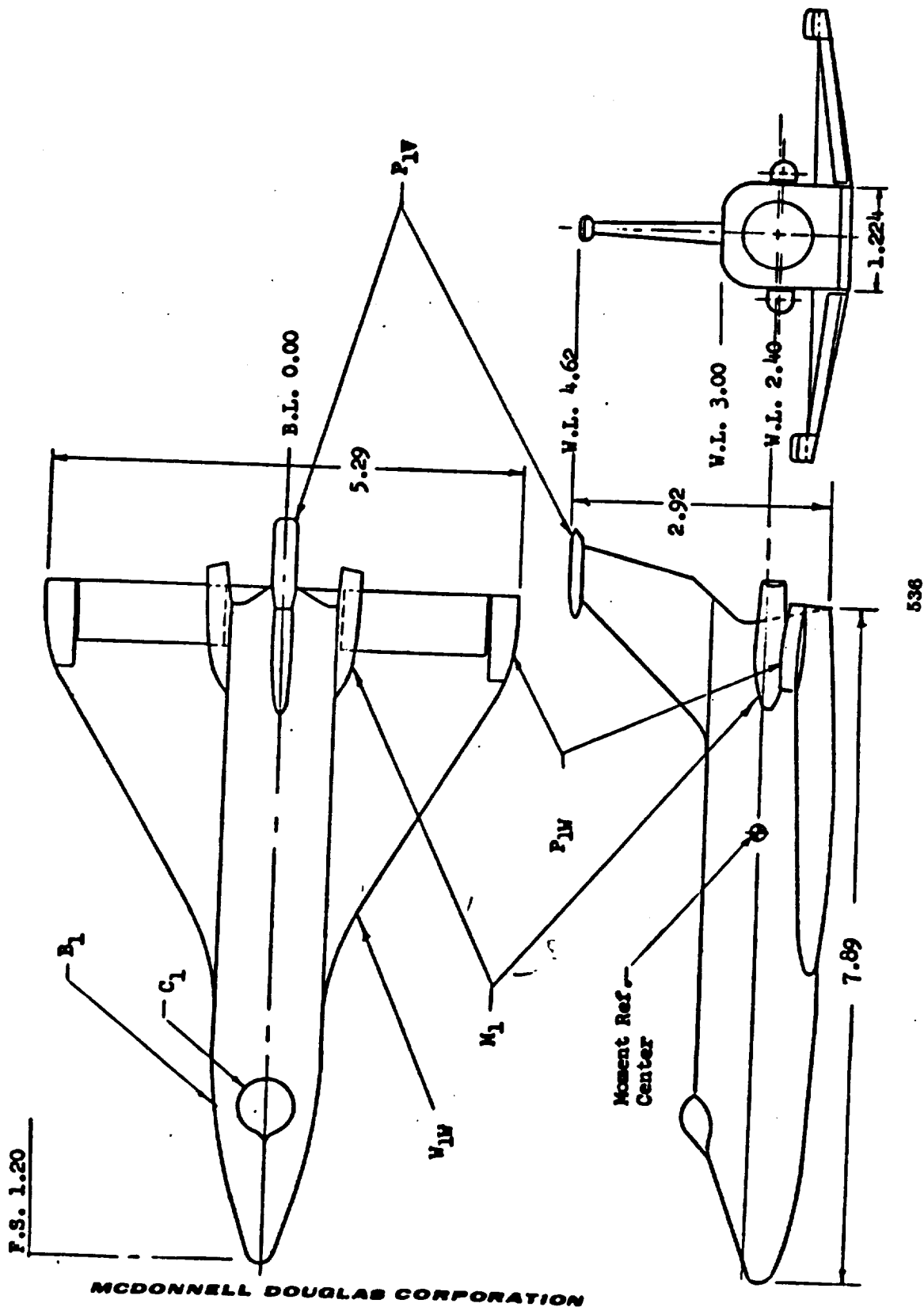
DELTA WING ORBITER
MSC

DR#1243 B-1- 433

MCDONNELL AIRCRAFT COMPANY

FIGURE 1 - GENERAL ARRANGEMENT, MSC 040 A ORBITER

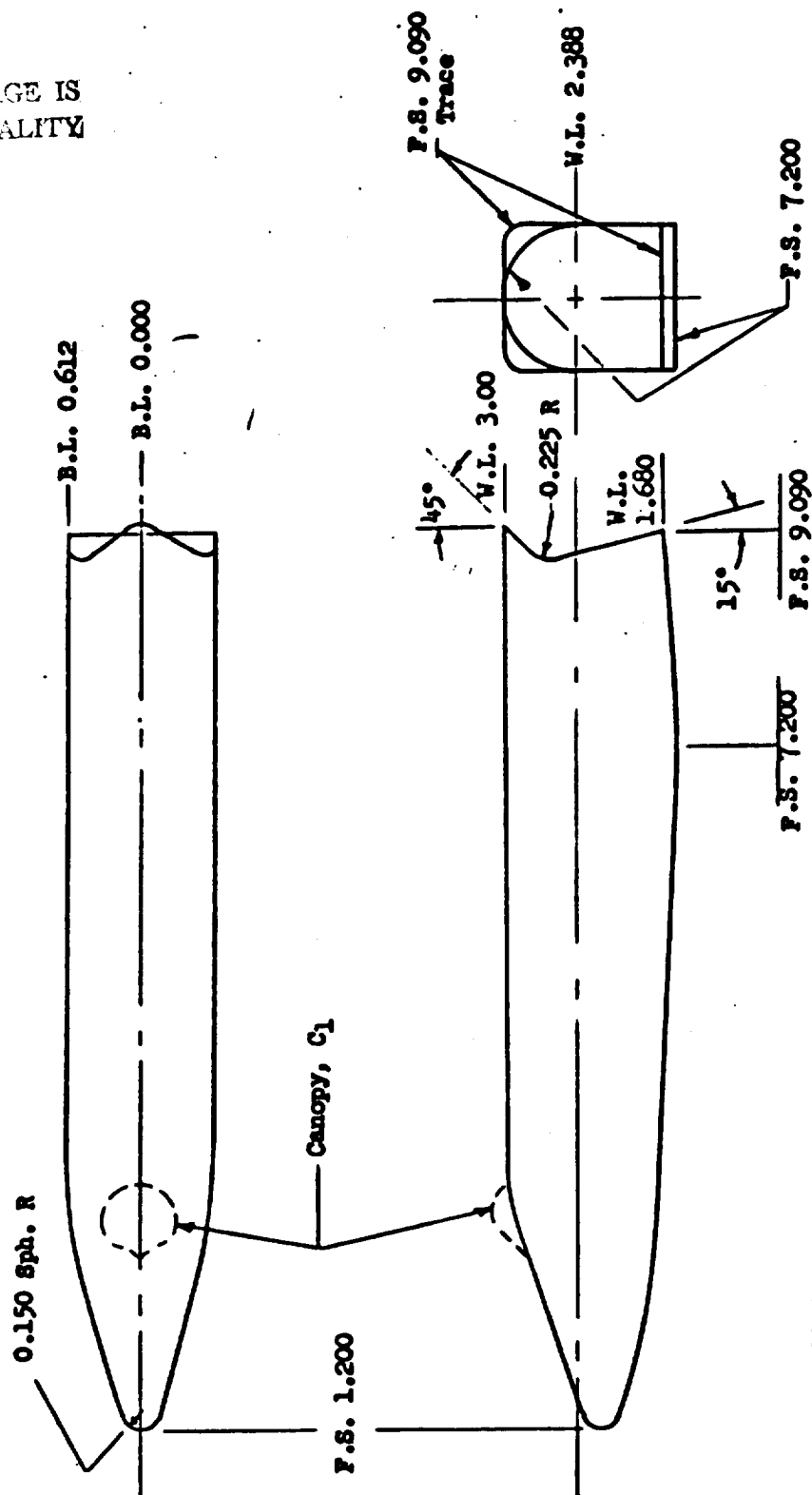
Note: All dimensions are model scale inches.



MCDONNELL DOUGLAS CORPORATION

ORIGINAL PAGE IS
OF POOR QUALITY

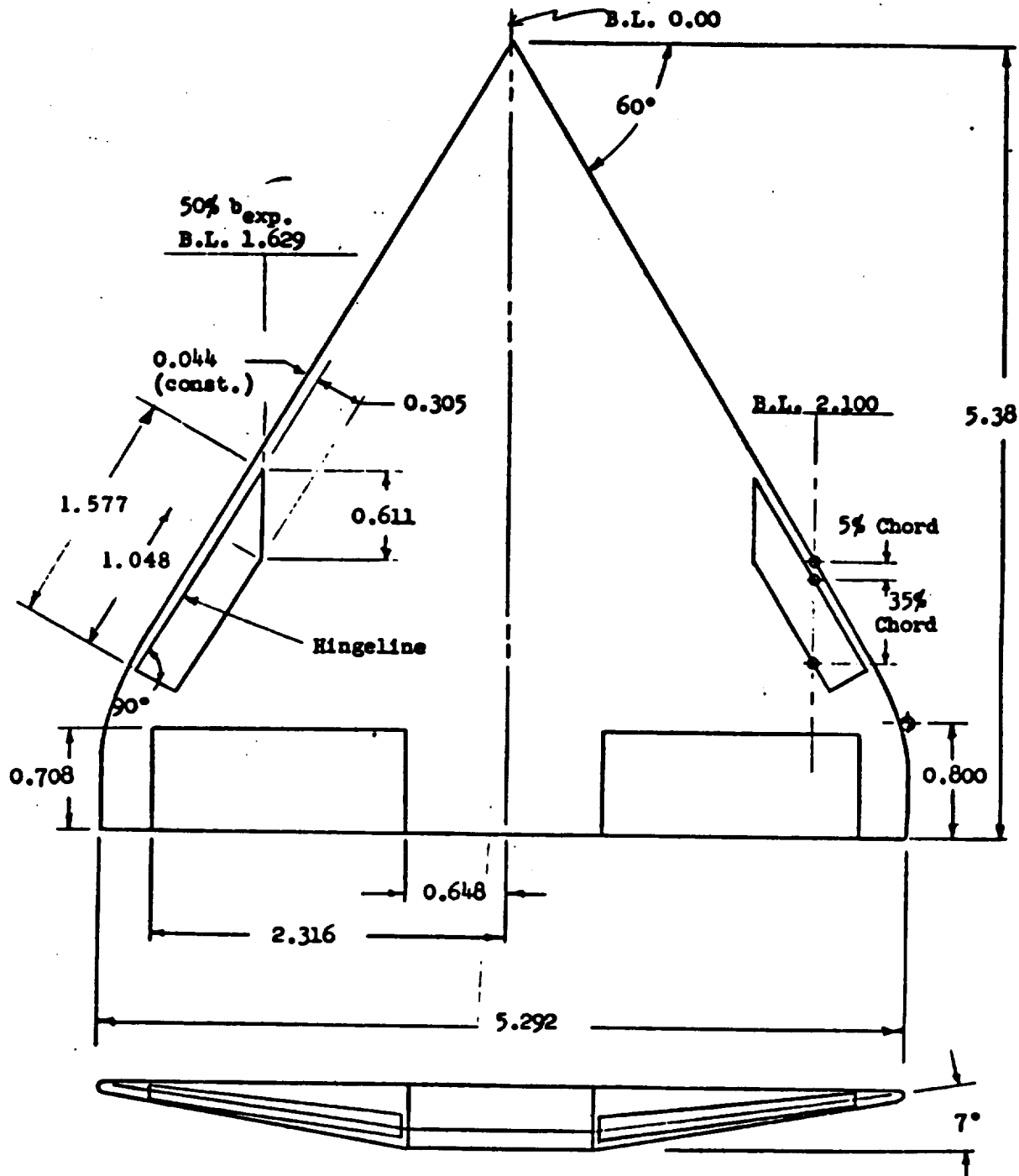
FIGURE 2 - B₁ BASELINE FUSELAGE



Note: All dimensions are model scale in inches.

FIGURE 3 - WING, FLAP AND ELEVON - W1W

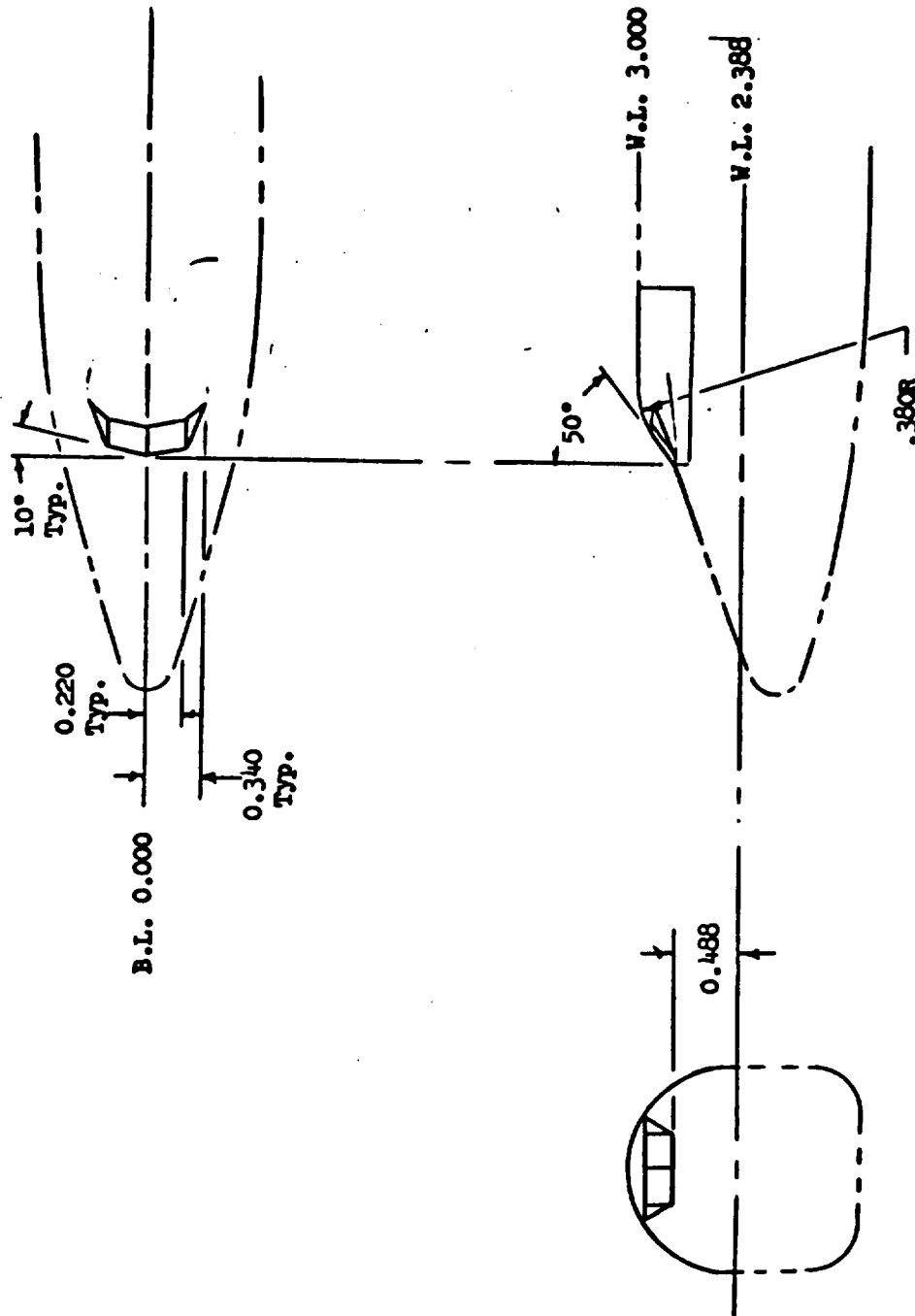
Notes: All dimensions are model scale in inches.
Surface flaps shown in undeflected position.



MCDONNELL AIRCRAFT COMPANY

FIGURE 4 - C₄ - ALTERNATE CANOPY

Note:
All dimensions are model scale in inches.



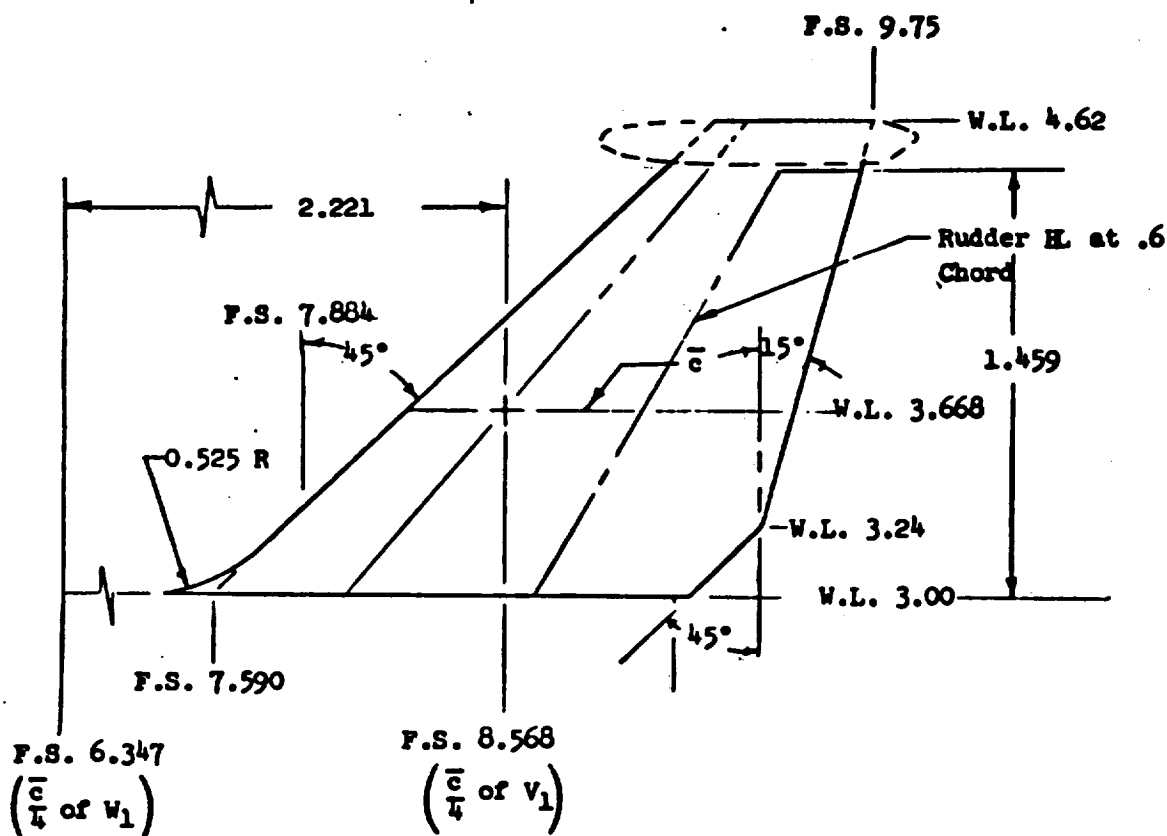
DELTA WING ORBITER
MSC
DR#1243 B-1- 437

MCDONNELL DOUGLAS CORPORATION

MCDONNELL AIRCRAFT COMPANY

FIGURE 5 - V_1 And V_9 VERTICAL TAIL AND RUDDER

$S_V = 1.837 \text{ in.}^2$	$C_R = 1.728$
$b = 1.620$	$C_T = 0.540$
$\bar{c} = 1.238$	$\lambda = .31$
$AR = 1.43$	$\Lambda_{L.E.} = 45^\circ$

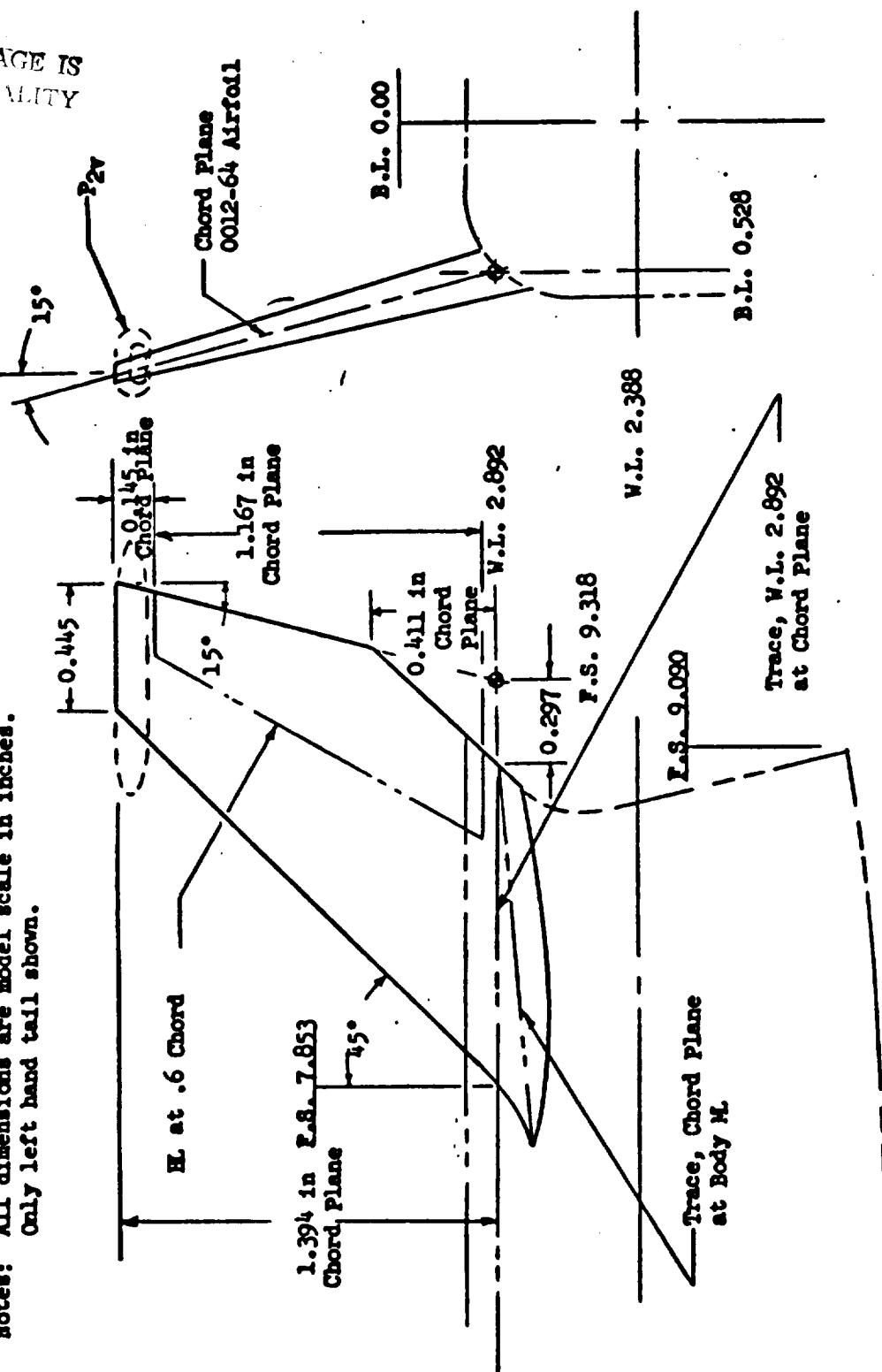


Notes: All dimensions are model scale in inches.
Vertical tail attached at B.L. 0.00.

ORIGINAL PAGE IS
OF POOR QUALITY

FIGURE 6 - V_3 - TWIN VERTICAL TAILS AND RUDDERS

Notes: All dimensions are model scale in inches.
Only left hand tail shown.



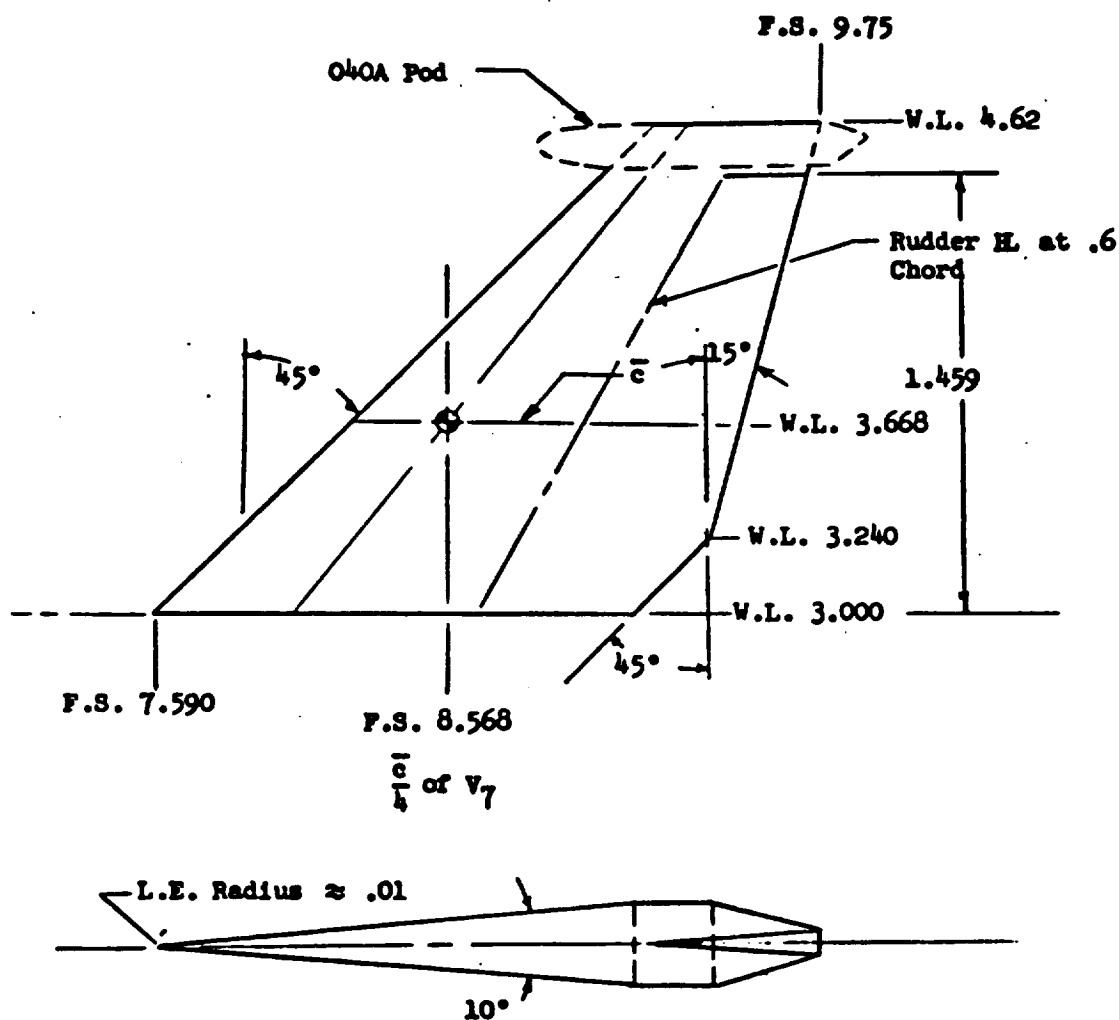
MCDONNELL DOUGLAS CORPORATION

MCDONNELL AIRCRAFT COMPANY

FIGURE 7 - V_7 - ALTERNATE CENTERLINE VERTICAL TAIL AND RUDDER

$S_v = 1.837 \text{ in.}^2$	$C_R = 1.728$
$b = 1.620$	$C_T = .540$
$\bar{c} = 1.238$	$\lambda = .3125$
$AR = 1.43$	$\Lambda_{L.E.} = 45^\circ$

Notes: All dimensions are model scale in inches.
Vertical tail attached at B.L. 0.00.



Technical drawing of a delta wing model showing plan, side, and end views with dimensions and a table of parameters.

Plan View Dimensions:

- Spanwise positions: F.S. 7.851, B.L. 0.612, F.S. 9.090, F.S. 9.36
- Angles: $4^\circ 45'$, $13^\circ 45'$, $3^\circ 45'$
- Radius: R
- Distance from leading edge: X_{BP}

Table of Parameters:

R	X_{BP}
0.000	0.000
0.090	0.150
0.142	0.350
0.168	0.450
0.177	0.600
0.175	0.798
0.144	1.470

Side View Dimensions:

- W.L. 2.340

Note: All dimensions are model scale in inches.

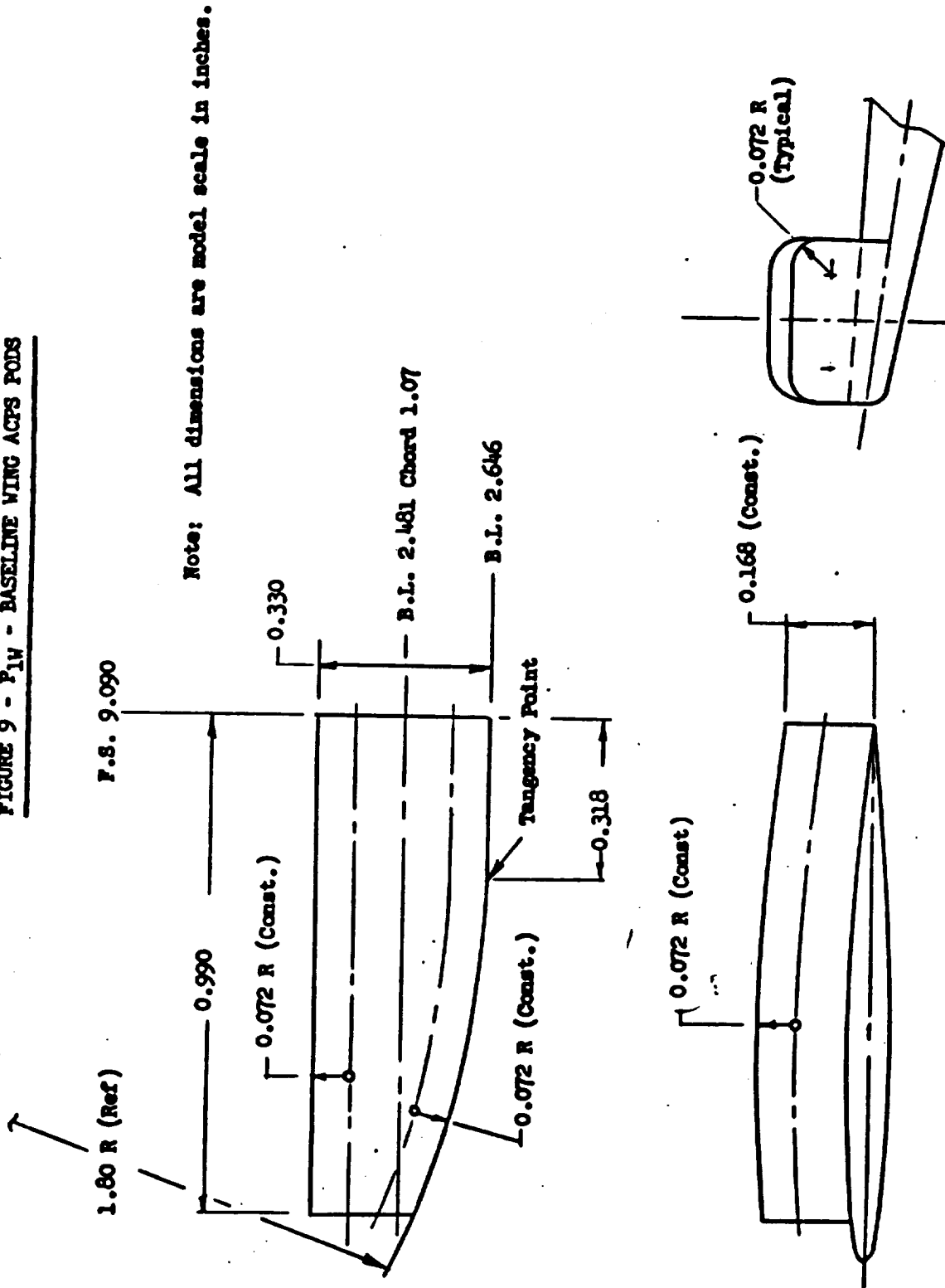
DELTA WING ORBITAL MANEUVERING SYSTEM (OWMS) MSC

Note: All dimensions are model scale in inches.

W.L. 2.340

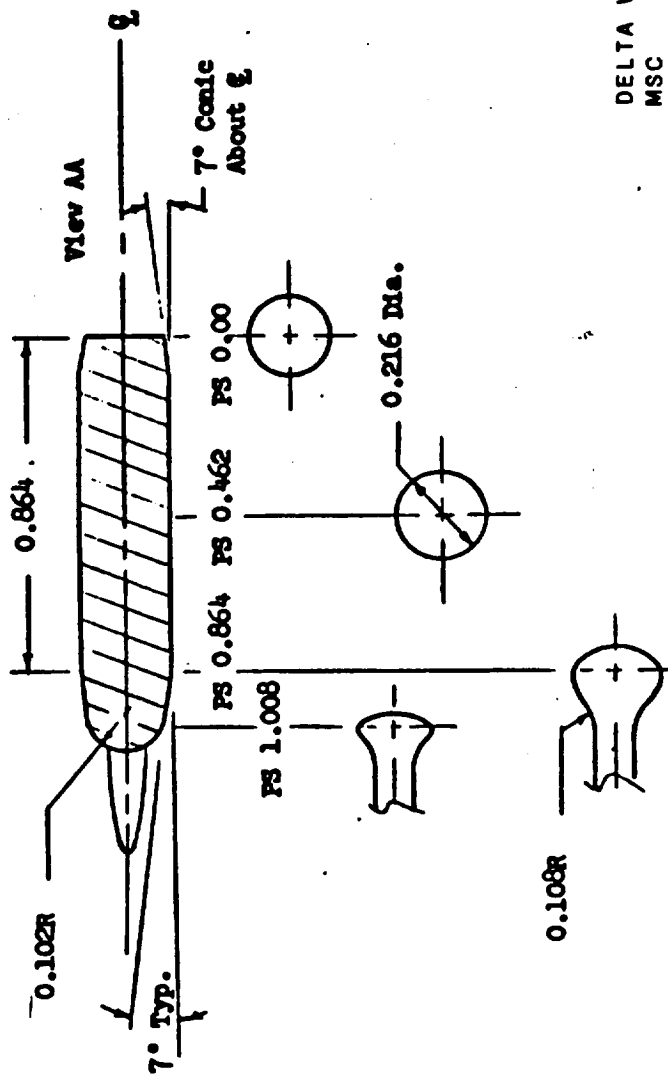
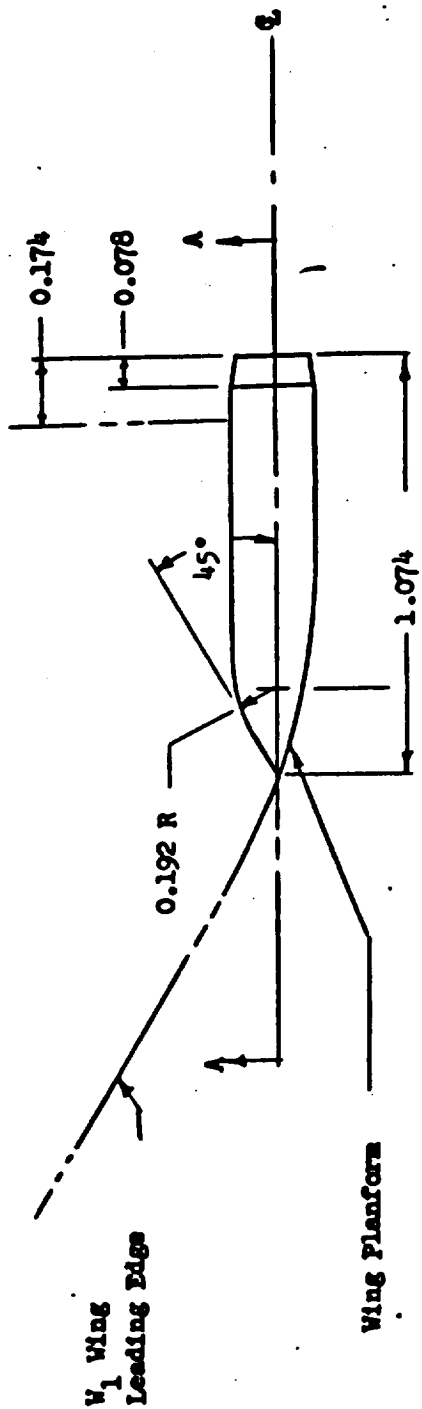
MCDONNELL AIRCRAFT COMPANY

FIGURE 9 - P_{1W} - BASELINE WING ACFS PODS



MCDONNELL DOUGLAS CORPORATION

FIGURE 10 - P_{2H} - ALTERNATE WING ACTS POD



Notes:
All dimensions are model
scale in inches.

DELTA WING ORBITER
MSC
DR#1243 B-1- 443

MCDONNELL AIRCRAFT COMPANY

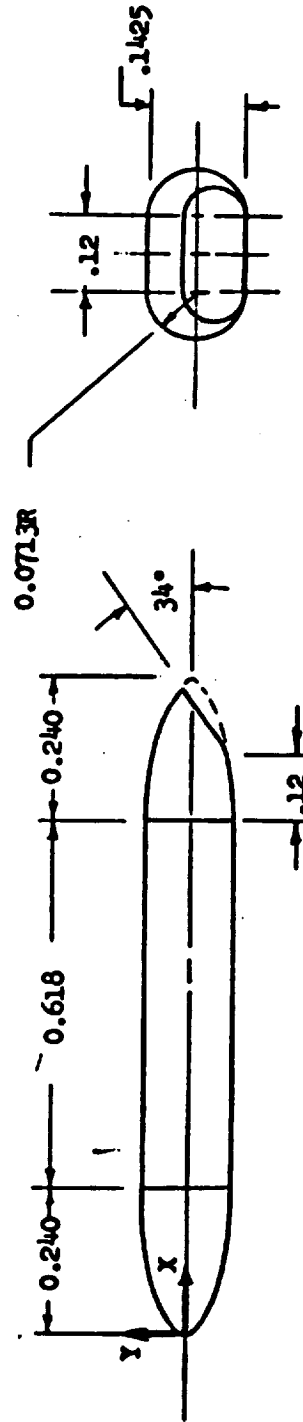
FIGURE 11 - P_{IV} - BASELINE VERTICAL TAIL ACTS POD

One half body of revolution created
through use of NACA 63₃-018 airfoil
Typical Each Corner

X Inches*	Y Inches
0.0000	0.0000
0.0034	0.0111
0.0051	0.0136
0.0086	0.0176
0.0171	0.0246
0.0343	0.0345
0.0514	0.0420
0.0686	0.0481
0.1029	0.0572
0.1371	0.0637
0.1714	0.0681
0.2057	0.0706
0.2400	0.0713

L.E. Rad. = 0.0145

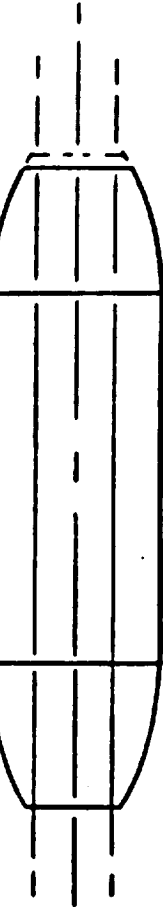
MCDONNELL DOUGLAS CORPORATION



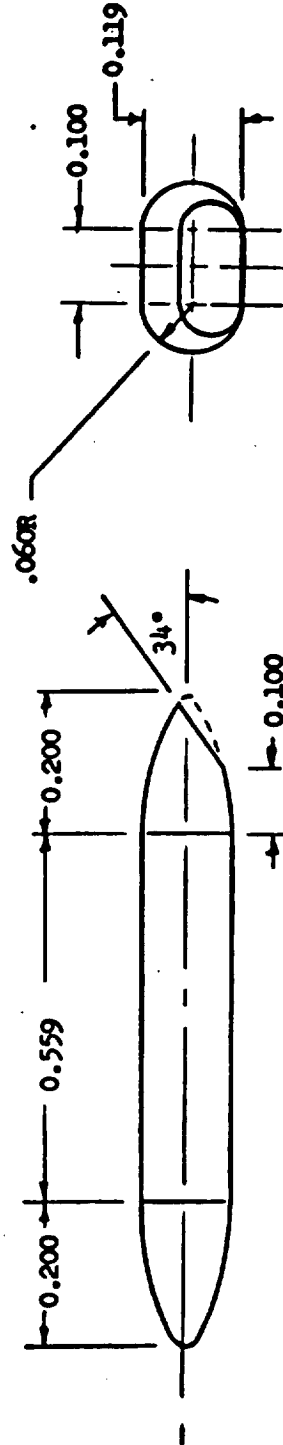
Note: All dimensions are model scale in inches.

FIGURE 12 - P2V - TWIN VERTICAL TAILS ACPS PODS

One half body of revolution created
through use of NACA 63₃-018 airfoil
Typical each corner



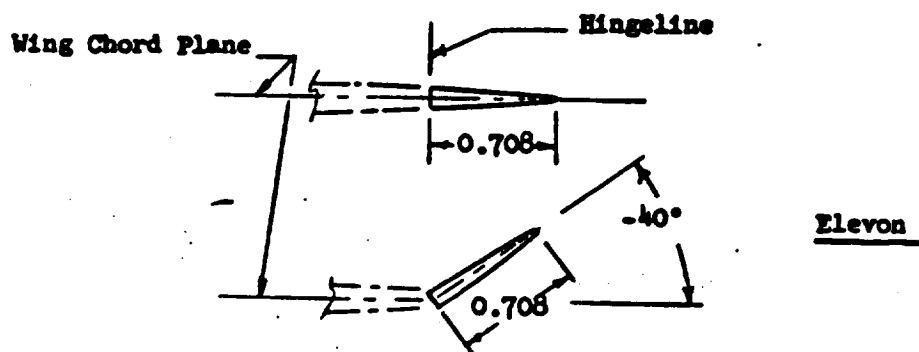
ORIGINAL PAGE IS
OF POOR QUALITY



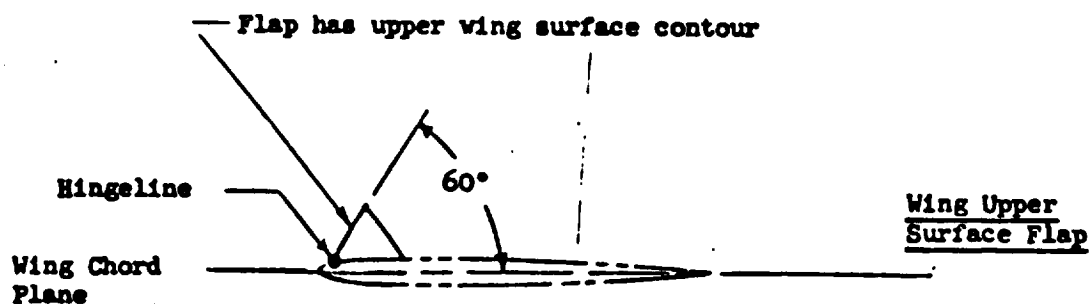
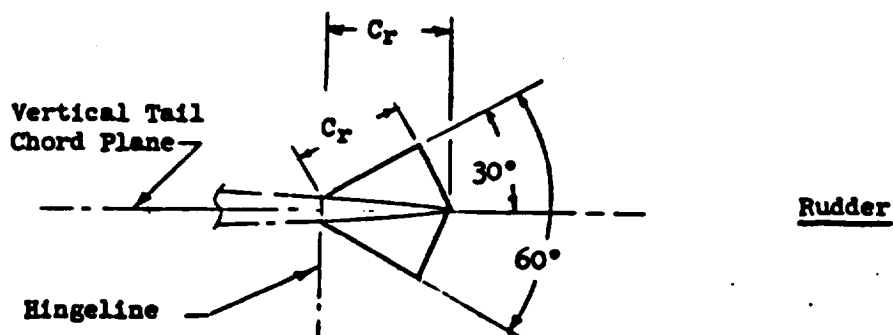
Note: All dimensions are model scale in inches.

MCDONNELL AIRCRAFT COMPANY

FIGURE 13 - TYPICAL ELEVON, RUDDER AND FLAP DEFLECTIONS



Note: Dimensions are model scale in inches.



Note: View is parallel to flap hingeline and wing leading edge.

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE 1.- DATA COLLATION SHEETS

TEST 11-628 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER		CONFIGURATION		SCHD.		PARAMETERS/VALUES						Mach No.		No. of Runs		Revolutions No. x 10 ⁻²								TEST RUN NUMBERS									
				a	B	δ _e	δ _a	δ _{gr}	δ _g					2.0	6.0	7.0	8.0																
RBF001	B ₁ C ₁ D ₁ W ₂ V ₂ P ₂	A	0°	0	0	0	0	0	0	0.6	2	9	62																				
002										0.9	2	52				59																	
003										1.1	1	5																					
004										1.2	2	1	56																				
005	A 4°	0	0	0	0	0	0	0	0	1.1	1	6																					
006										1.2	1	2																					
007		0°	B	0	0	0	0	0	0	1.1	2	7	58																				
008										1.2	2	3	55																				
009		10°	B	0	0	0	0	0	0	0.6	2	51	61																				
010										0.9	2	53				60																	
011										1.1	2	8	57																				
012										1.2	2	4	54																				
013	A 0°	-10	0	0	0	0	0	0	0	0.6	2	11	22																				
014										0.9	2	14				19																	
015										1.2	2	15	17																				
016		10°	B	-10	0	0	0	0	0	0.6	2	12	21																				
017										0.9	2	13				20																	
018										1.2	2	16	19																				
019	A 0°	-30°	0	0	0	0	0	0	0	1.2	2	76	75																				

COEFFICIENTS:
a or B
SCHEDULES
A - 1 - 15 4 00
B - 1 - 15 12 4 00

DELTA WING ORBITER
MSC
DR#1250 B-1- 447

549

TABLE 1.- Continued.

TEST 11-628 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST

TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES						Mach No.	No. of Runs	Revolutions No. x 10 ⁻²																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		a	B	δ_a	δ_n	δ_{rr}	δ_r	δ_{θ}	δ_{ϕ}			2.0	6.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
RBF020	B ₁ C ₃ D ₁ W ₂ V ₀ P ₁₀	10	B	0	0	0	0	0	0	0.6	2	63	68																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</

7 13 19 25 31 37 43 49 55 61 67 73

COEFFICIENTS: \rightarrow IDPVAR(1) IDPVAR(2) INDV

a or B SCHEDULES \rightarrow 6 - 4 - 2 - 1 0.1 2.4 6.0

NASA-WFPC-MAP

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE 1- Concluded:

TEST 11-628 DATA SET/RUN NUMBER
COLLATION SUMMARY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES					Mean No.	No. of Runs	Reynolds No. $\times 10^{-6}$										TEST RUN NUMBERS									
		a	b	δ_e	δ_n	δ_{ref}	δ_r	δ_{ref}			2.0	3.0	3.2	3.7	4.3	5.0	5.7	6.0	6.5	7.0										
RBF-032	7																													
RBF-033	Delta 11 1/2 Vals	5	5	0	0	0	0	0	1.2	6	32	40		41	42	43	44													
034	↑	12	6	↑	↑	↑	↑	↑	0.6	6	33		32	29	29	28	29			25	24									
035		10	5						1.2	6	50	49		43	47	46	45													

DELTA WING ORBITER
MSC
DR#1250 B-1- 449

WING
5° DIHEDRAL
1.5° INCIDENCE
50° SWEEP

Full scale dimensions
in inches

WING, W₂

B.L. 441

ACPS POD MSC
P_{1W}

ELEVON

B.L. 102

ACPS POD,
PIV

W.L. 835.14

RUDDER

W.L. 500

ACPS POD,
P_{1W}

W.L. 264

Transition
Strip

NOSE, B₁

FULL SCALE
STA

1515

1397

1300

1200

1067.9

916.4

700

650

425

280

200

465.5

MANIPULATOR HOUSING, D₁

Transition Strip

VERTICAL FIN, V₈

CANOPY, C₃

W.L. 400 & PAYLOAD (BASIC REF)

900°R

3°

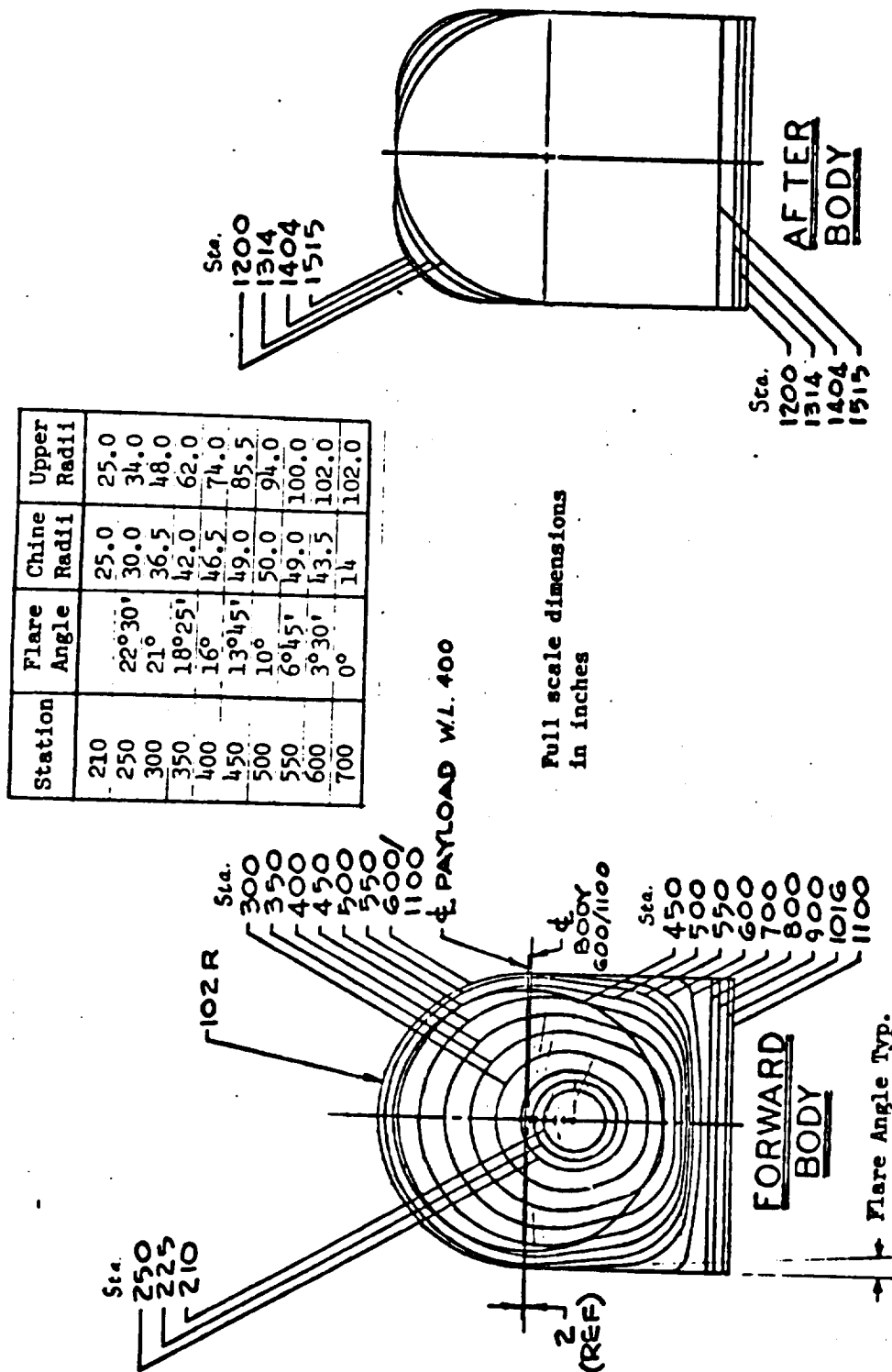
TP

(65.75 IN MODEL SCALE)

1315

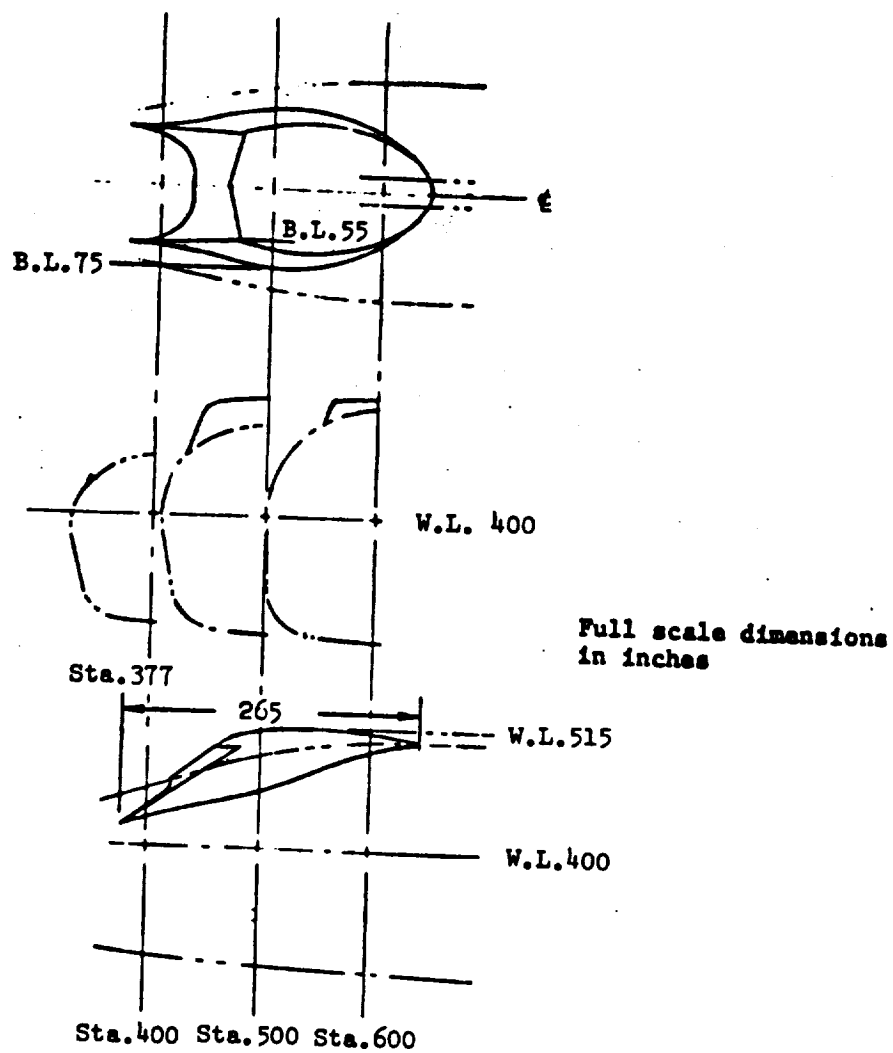
(a) Side and top views of B₁C₃D₁V₈P₁ Configuration
Figure 2.- Model description

ORIGINAL PAGE IS
OF POOR QUALITY



(b) Cross-sections of B₁ body

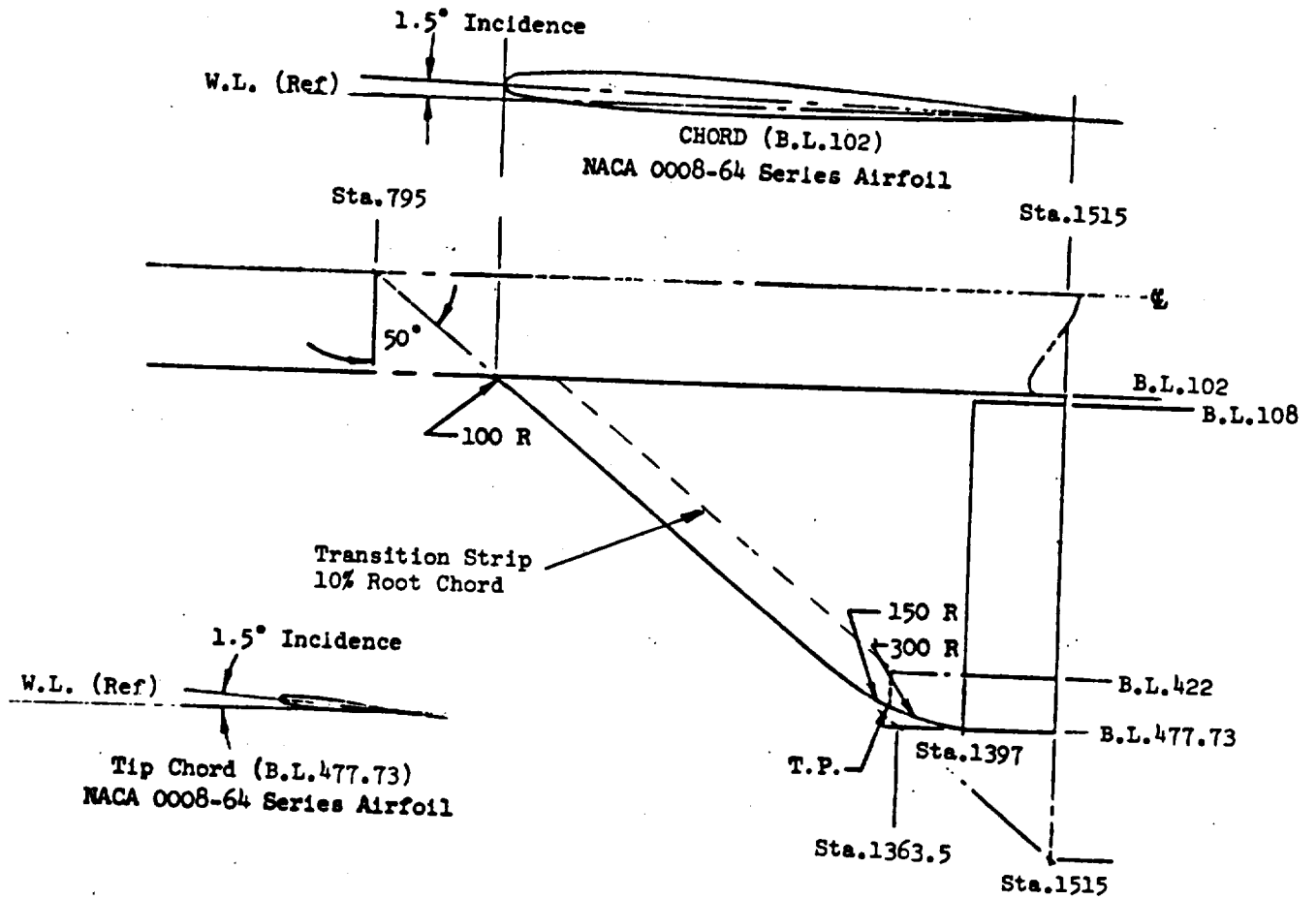
Figure 2.- Continued.



(c) Canopy C₃

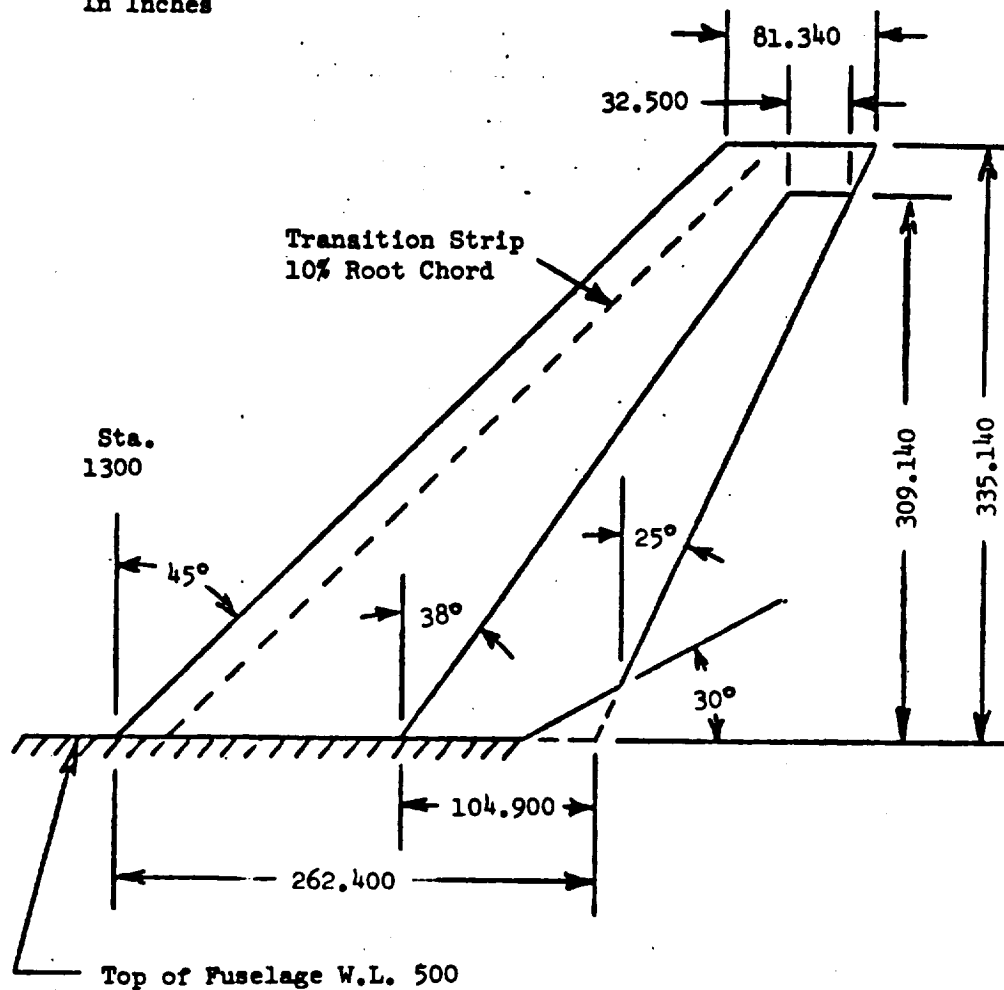
Figure 2.- Continued.

Full scale dimensions
in inches

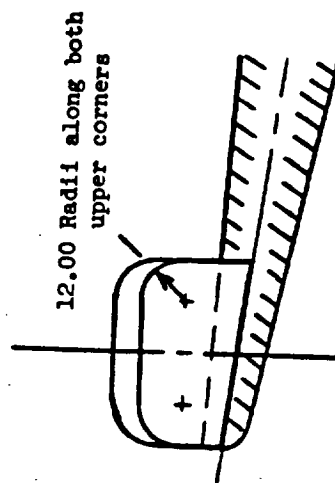
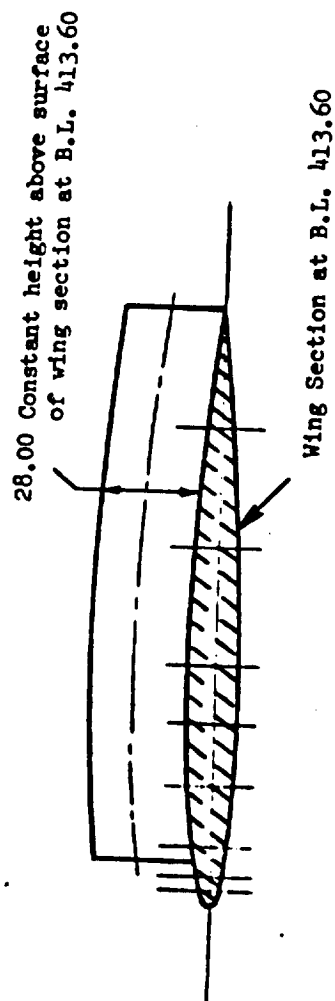
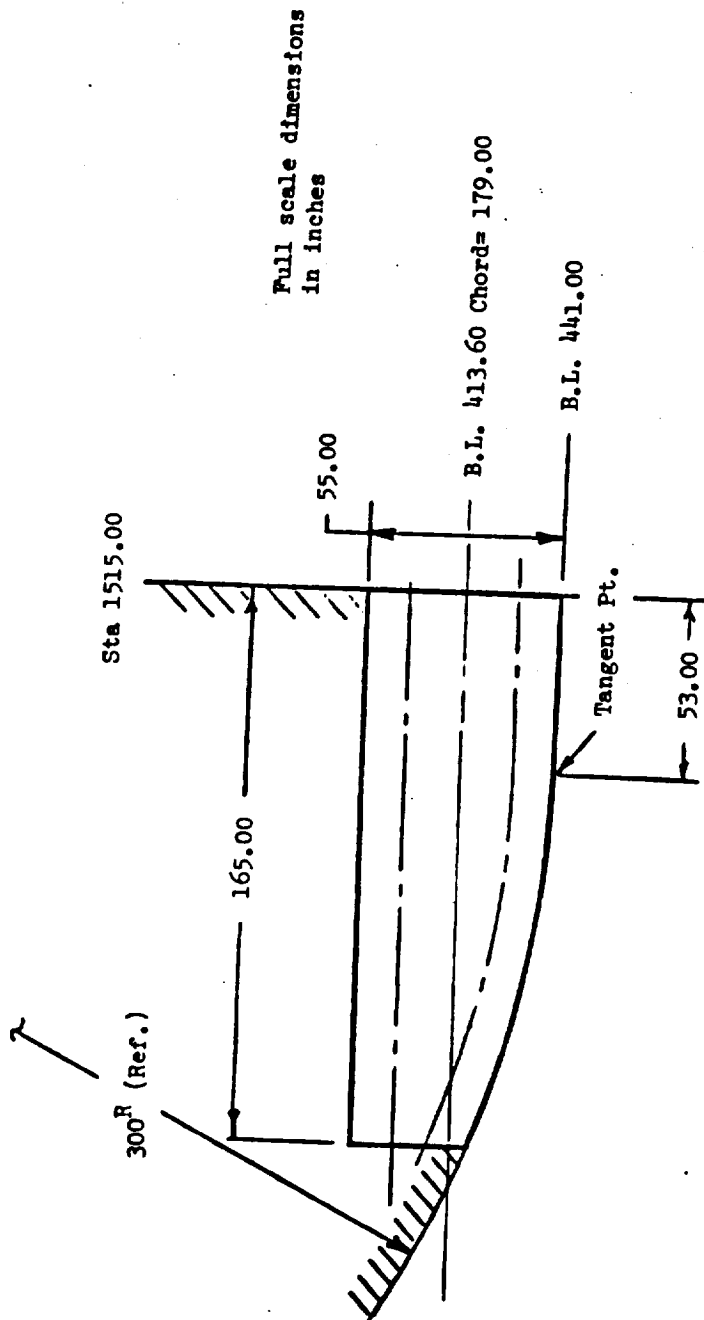


(d) Wing W₂
Figure 2.- Continued.

Airfoil NACA 0008-64
Full Scale Dimensions
In Inches



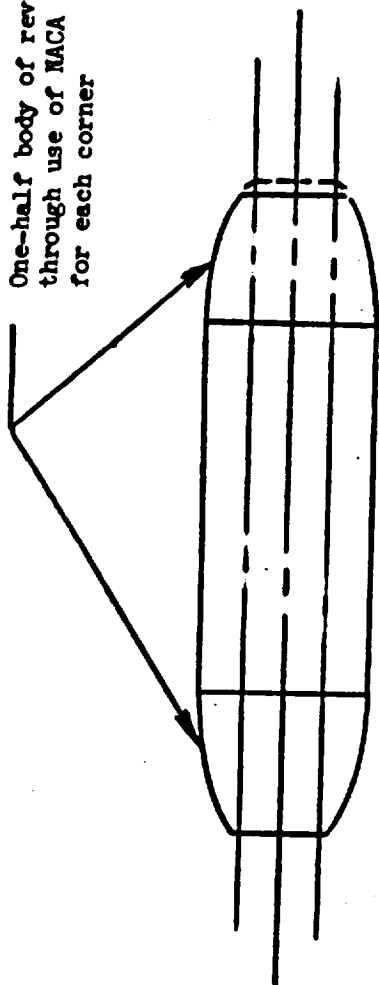
(e) Vertical Fin V₈
Figure 2.- Continued



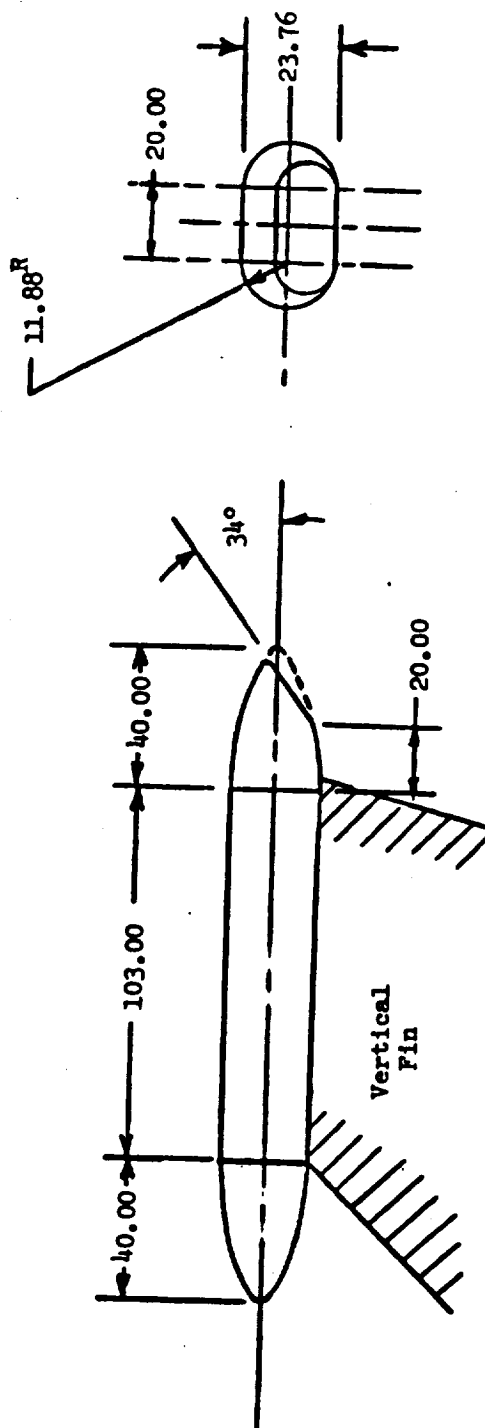
(r) Wing ACPS pod, PLW
Figure 2.- Continued.

DELTA WING ORBITER
MSC
DR#1250 B-1- 455

One-half body of revolution created
 through use of MACA 63-018 airfoil
 for each corner

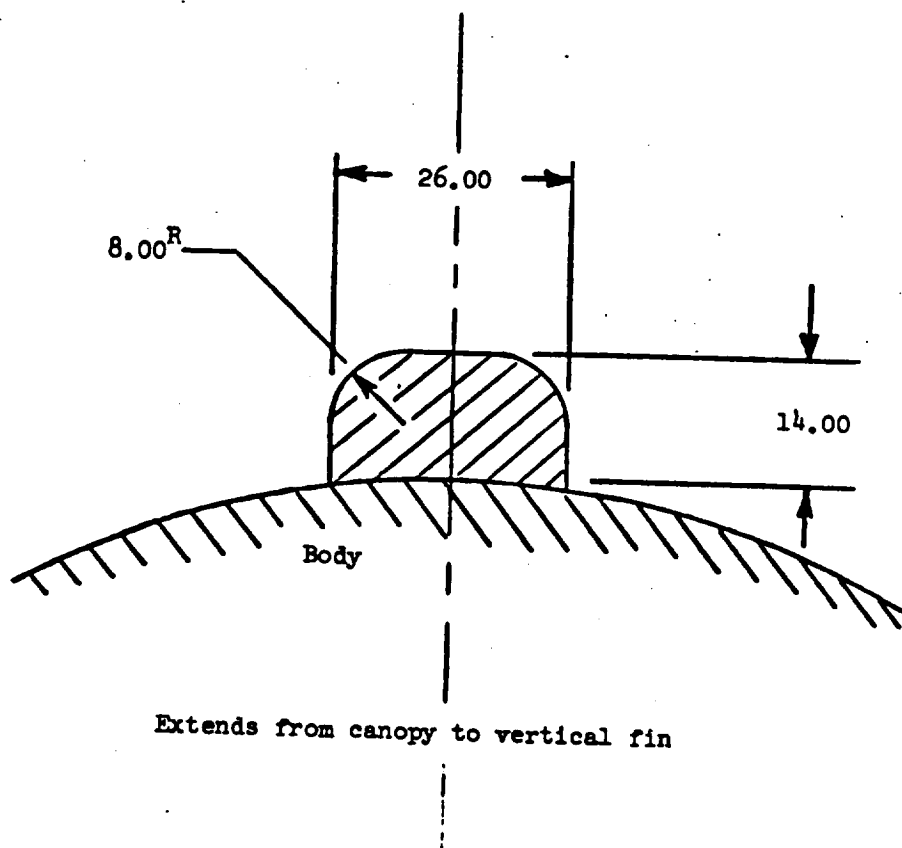


Full scale dimensions in inches



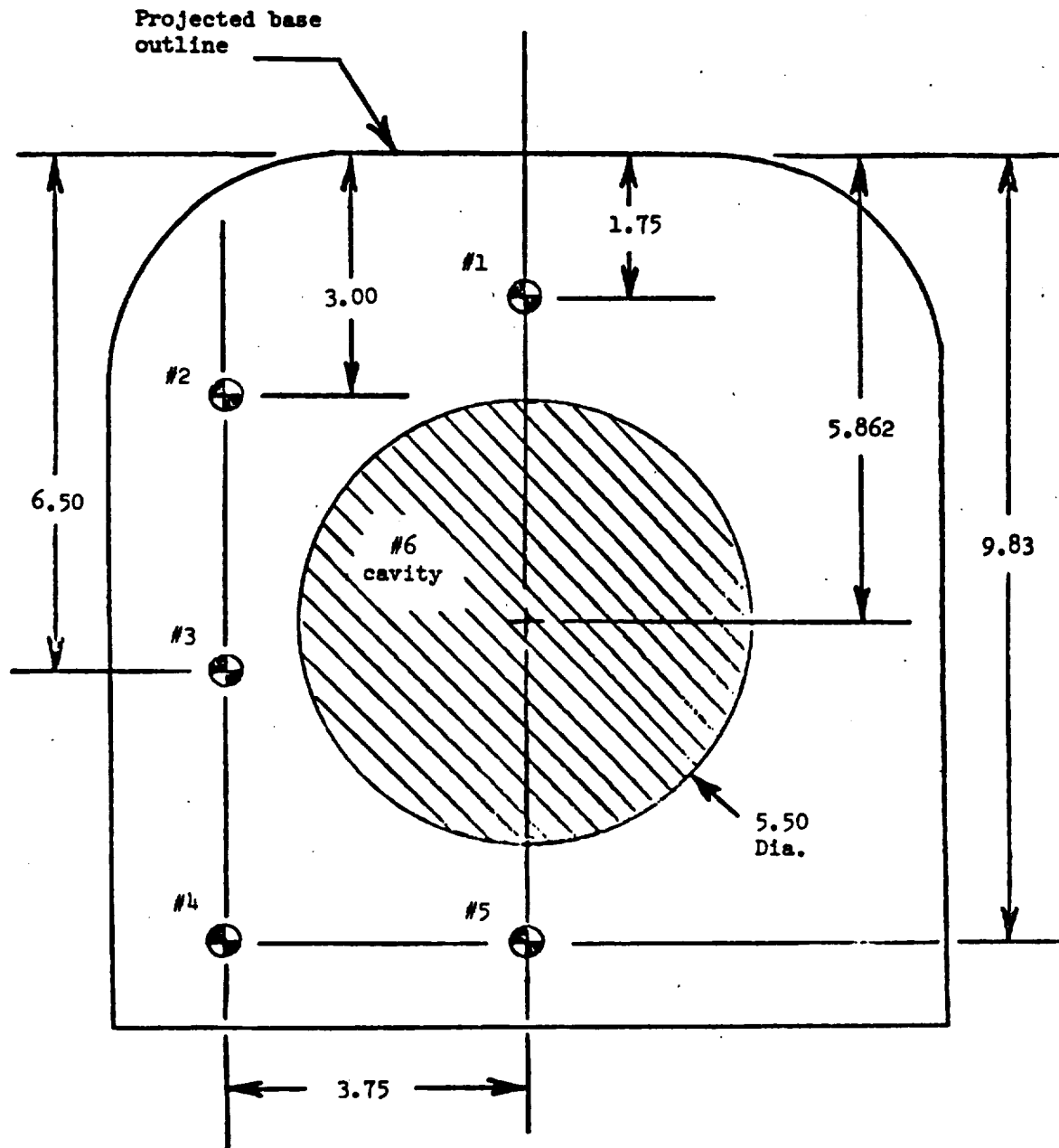
(g) Vertical Fin ACPS pod, P IV
 Figure 2.- Continued.

Full scale dimensions in inches



(h) Manipulator arm dorsal housing, D₁
Figure 2.- Continued.

Model scale dimensions in inches



(1) Base pressure locations
Figure 2.- Concluded.

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE II.
TEST LaRC-WPWT-977 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.			CONTROL DEFLECTION			NO. OF RINS	MACH NUMBERS				
		A	B	C	δ ₁	δ ₂	δ ₃		2.30	2.96	3.95	4.62	
R06001	BIGIPWIPWIPW	A	0	20	0	0	0	4	1	5	9	13	
02	Y1				45				25	29	33	37	
03					60				45	47	49	51	
04					75				53	57	61	65	
05					90				69	71	73	75	
06					45	45			114	117	118	121	
07	PIW				0	0			93	96	98	100	
08	Y1PIW				60				102	104	106	108	
09					75				77	81	85	89	
10	Y2				45				21	23	17	19	
11					60				122	125	126	129	
12					0				4	6	10	14	
13	Y1				45				26	30	34	38	
14					60				46	48	50	52	
15					75				54	58	62	66	
16					90				70	72	74	76	
17					45	45			115	116	117	120	
18	PIW				0	0			94	97	99	101	
19	Y1PIW				60				102	105	107	109	
20					75				78	82	86	90	

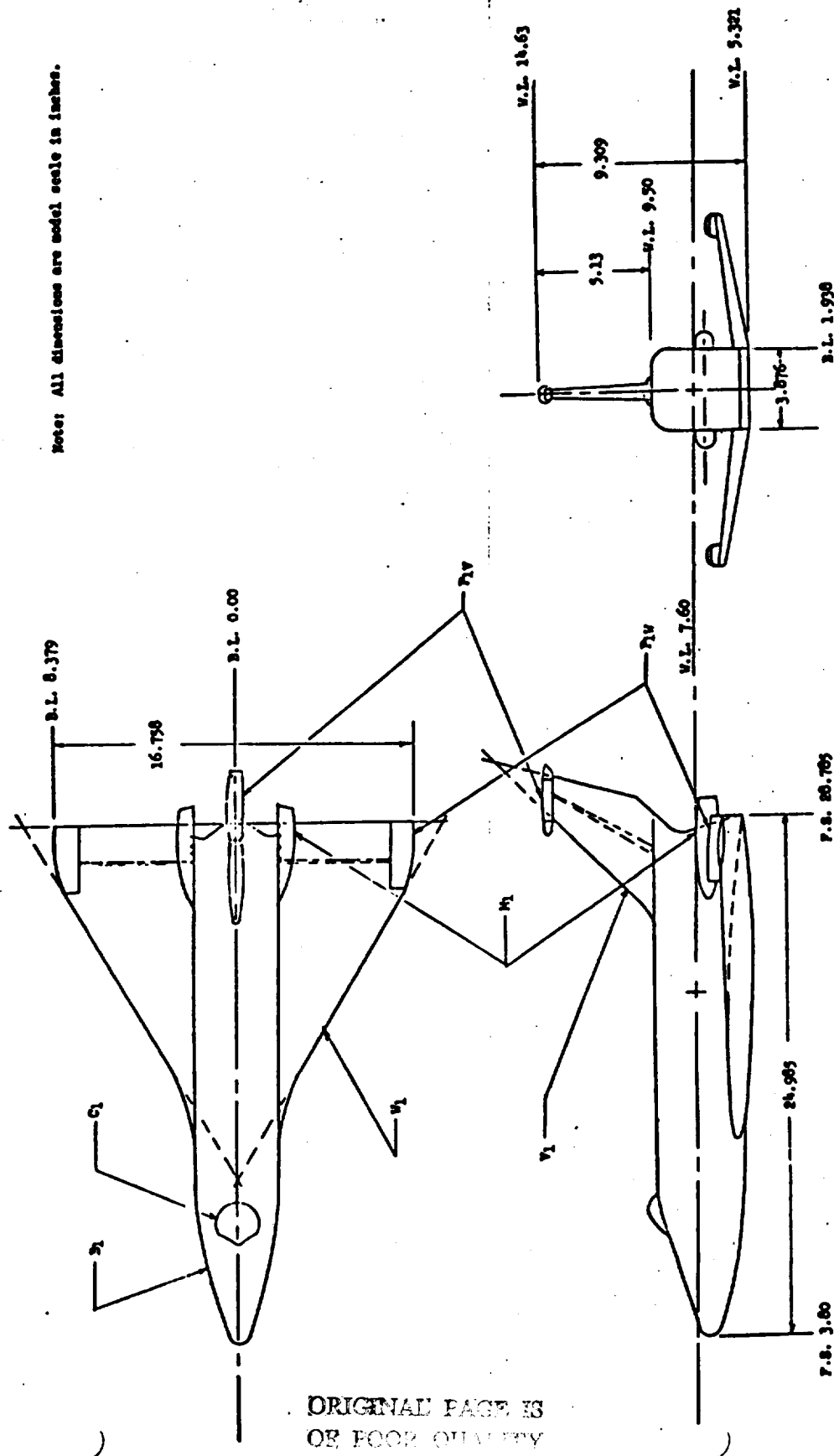
- α: 0, 2, 5, 11, 15, 19, 24, 28, 32, 36, 38

β: -4, -2, -1, 0, 1, 2, 3, 4, 6

α or β

BETA, IQ(PSE), CN, CAF, CLM, CBL, CYN, CY, CA, MACH, ALPHA, IDPVAR(1), IDPVAR(2)

DELTA WING ORBITER
MSC
DR#1258 B-1- 459

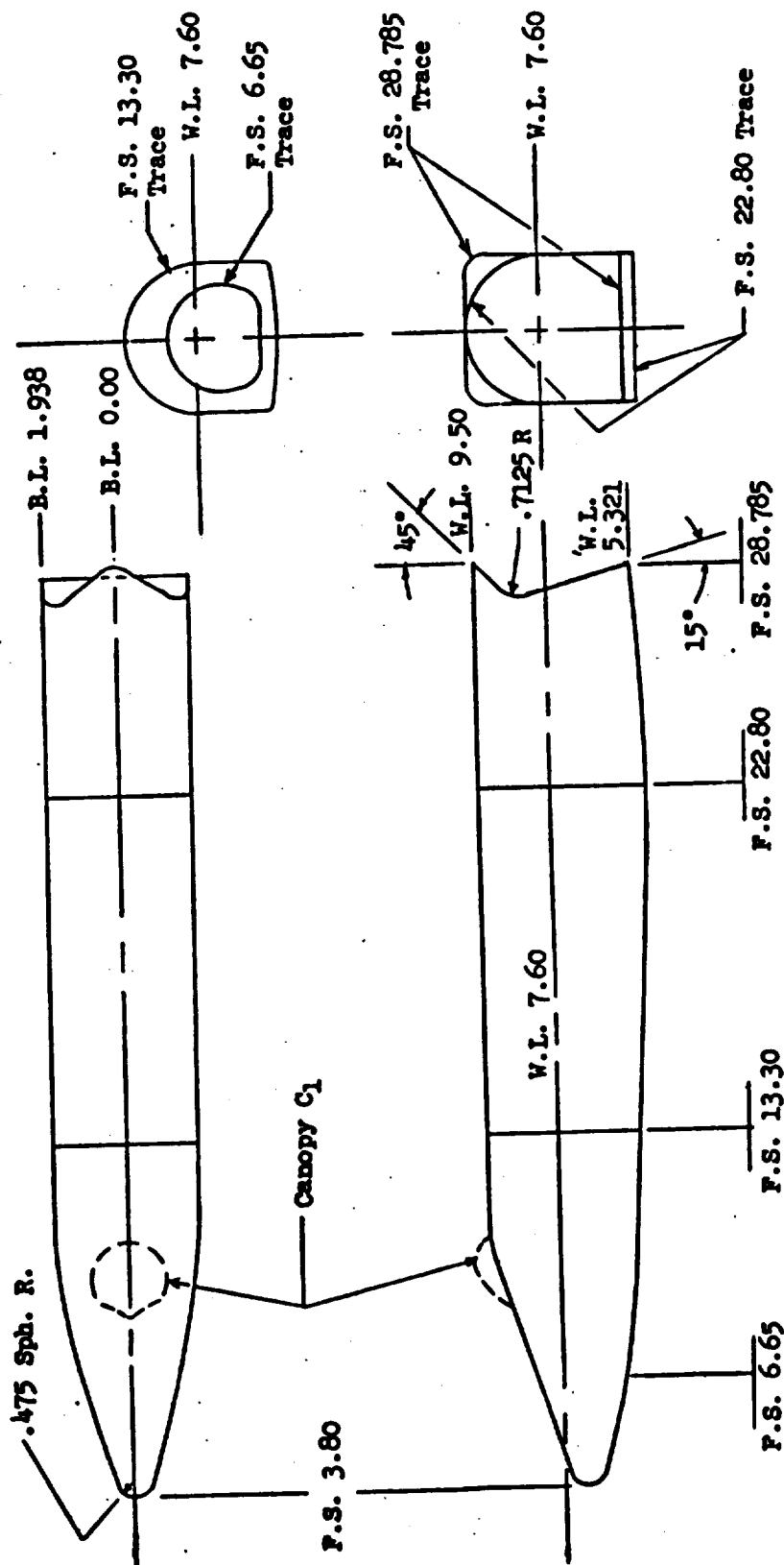


Note: All dimensions are model scale in inches.

ORIGINAL PAGE IS
OF POOR QUALITY

FIGURE 2. GENERAL ARRANGEMENT

DELTA WING ORBITER
MSC
DR#1258 B-1- 461



Note: All dimensions are model scale in inches.

Notes: All dimensions
are model scale
in inches.

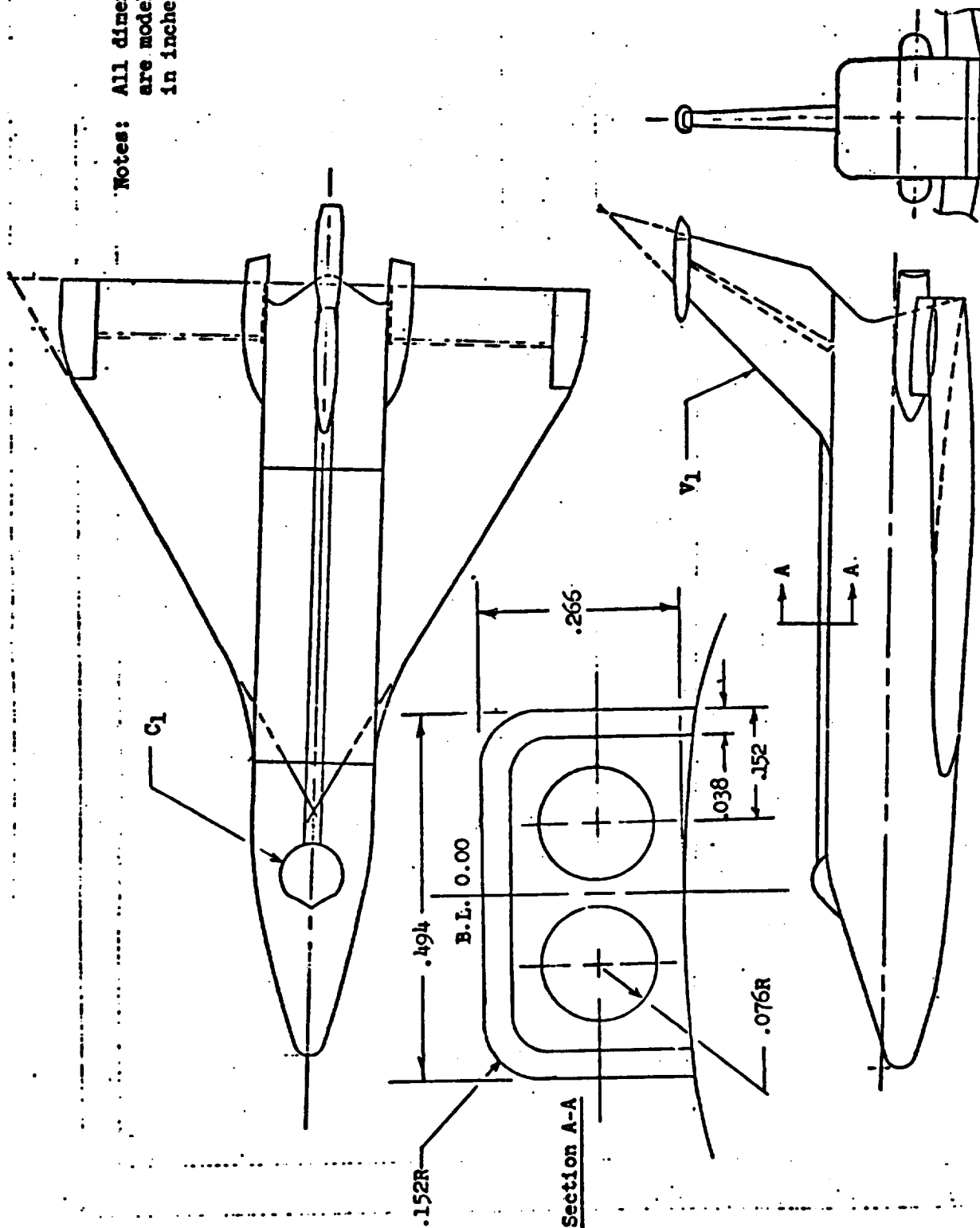


FIGURE 4. D1 - MANIPULATOR ARM DORSAL FOUSING

DELTA WING ORBITER
MSC
DR#1258 B-1- 463

B.L. 0.00
(Ref.)

Fuselage

g

13.694

B.L. 1.938
(Ref.)

B.L. 2.114

Elevon H. at
F.S. 26.543

30°11' (Tan = .58144)

8.550R

5.239

6.489

Incidence = 1.5°
Dihedral = 7°
Airfoil = 0008-64
Aspect Ratio = 1.7

B.L. 7.314

7.962

B.L. 8.379

2.533

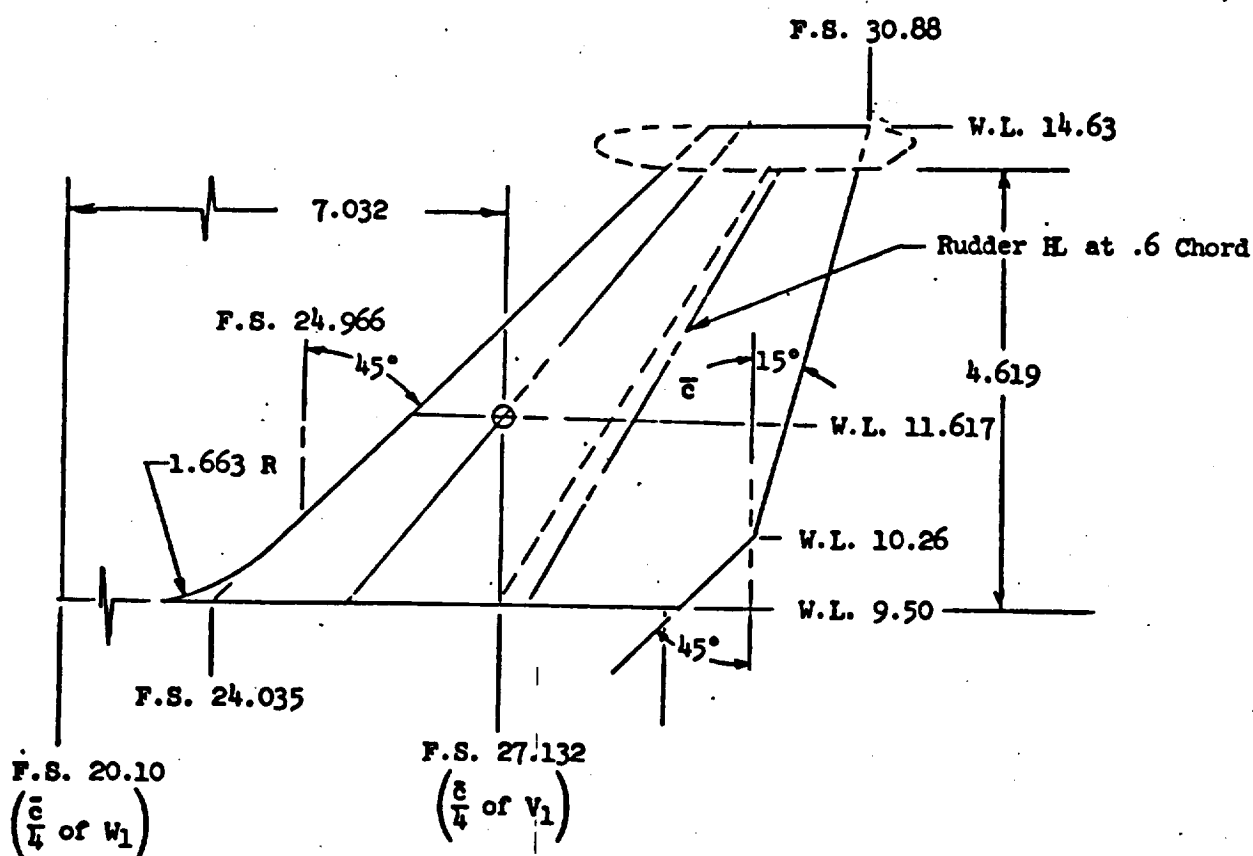
F.S. 28.785

Notes: All dimensions are model scale in inches, true view.
W_{1A} Configuration is same wing moved aft
so that the trailing edge is at F.S. 29.944.

FIGURE 5. W₁ - BASELINE DELTA WING AND ELEVONS

FIGURE 6. V_1 - BASELINE VERTICAL TAIL AND RUDDER

$S_V = 18.422 \text{ in.}^2$	$C_R = 5.472$
$b = 5.130$	$C_T = 1.710$
$\bar{c} = 3.919$	$\lambda = .31$
$AR = 1.43$	$\Lambda_{L.E.} = 45^\circ$



Notes: All dimensions are model scale in inches.
Vertical tail attached at B.L. 0.00.

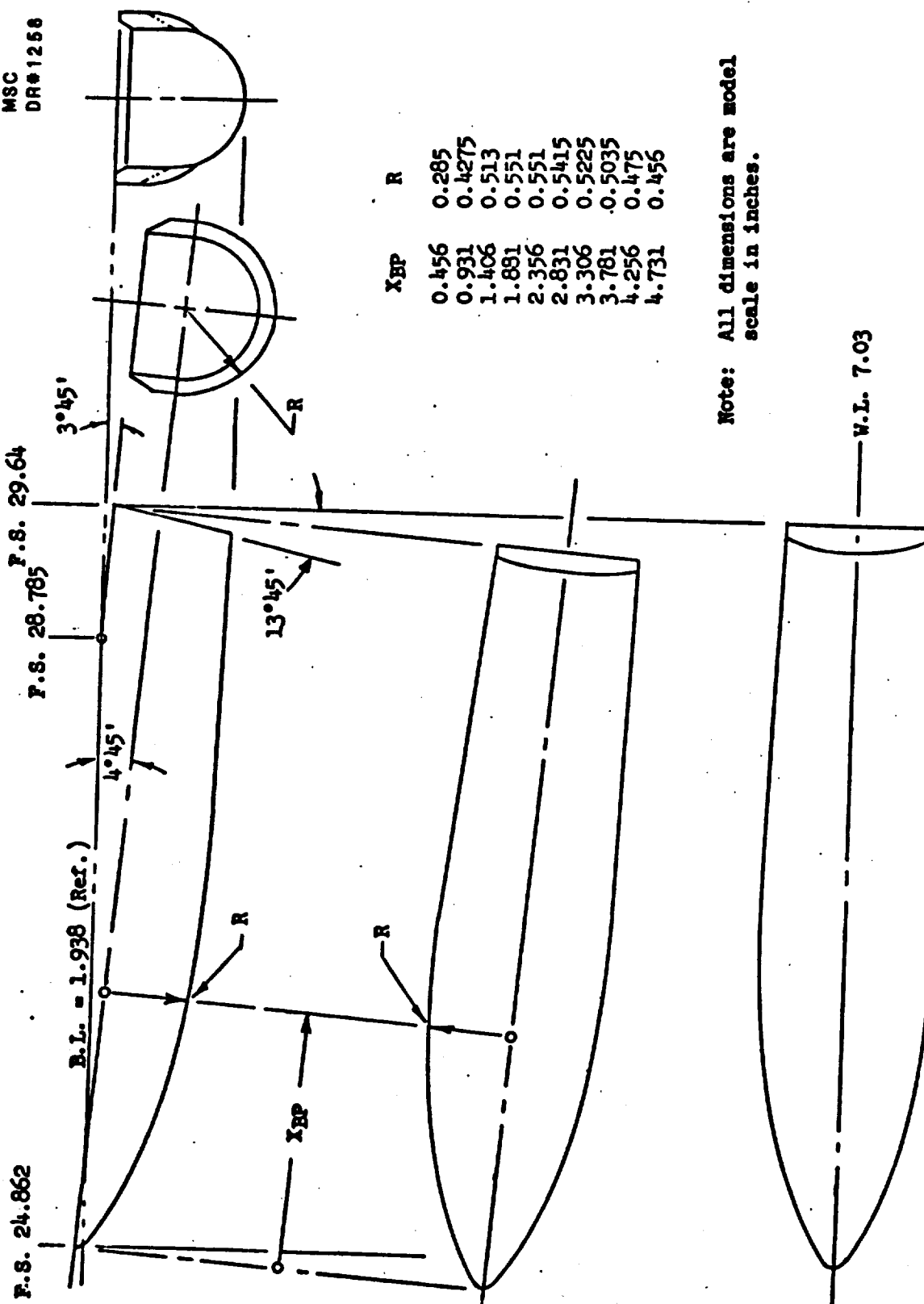
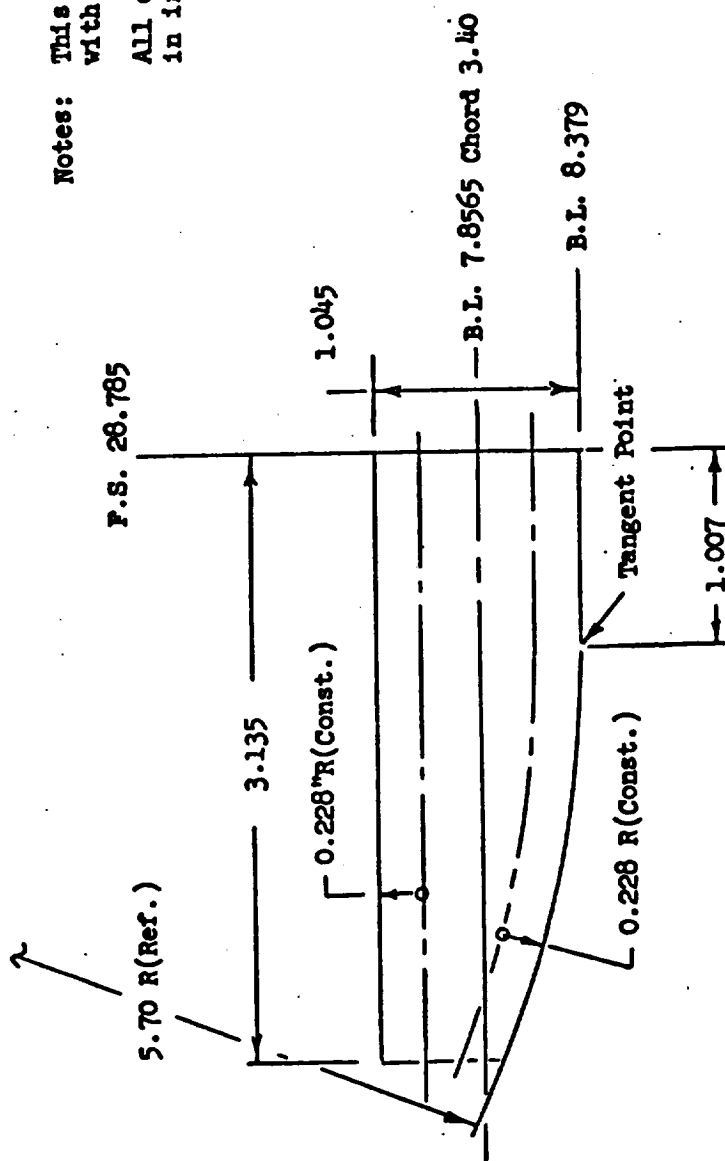


FIGURE 7. M1 - BASELINE ORBITAL MANEUVERING SYSTEM (OMS) ENGINE POD



Notes: This pod configuration is used with W1 and W2 wings.
All dimensions are model scale in inches.

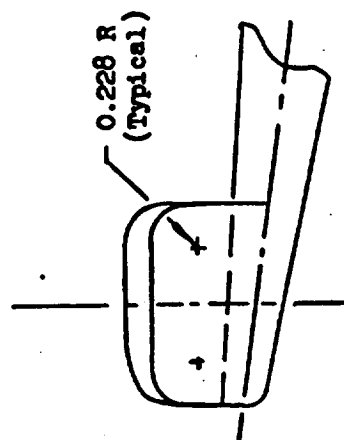
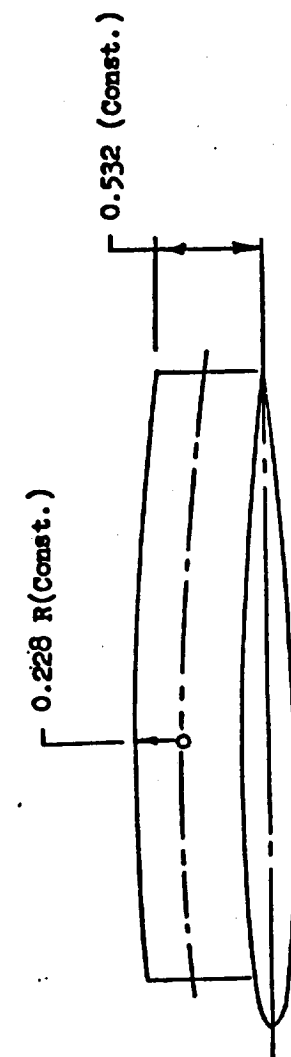
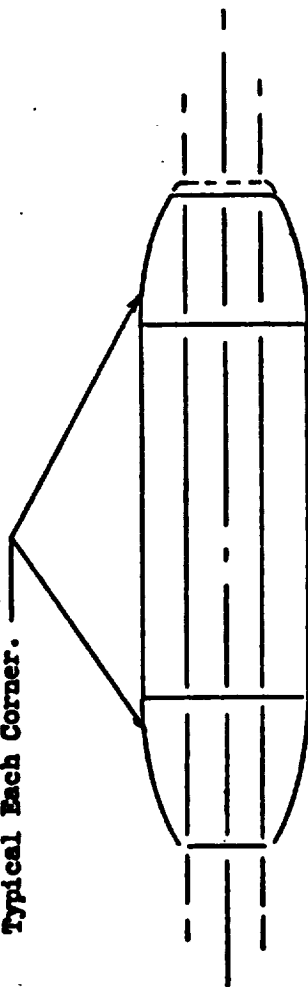


FIGURE 8. P1W - BASELINE WING (W1) ACPS PODS

DELTA WING ORBITER
MSC
DR#1258 B-1- 467

Note: All dimensions are model scale in inches.

One Half Body of Revolution Created
Through Use of NACA 633-018 Airfoil.
Typical Each Corner.



X	Y
Inches	Inches
0	0
0.0109	0.0352
0.0163	0.0430
0.0271	0.0556
0.0543	0.0779
0.1086	0.1094
0.1629	0.1331
0.2171	0.1522
0.3257	0.1812
0.4343	0.2018
0.5429	0.2157
0.6514	0.2235
0.7600	0.2257

L.E.Rad. = 0.0460

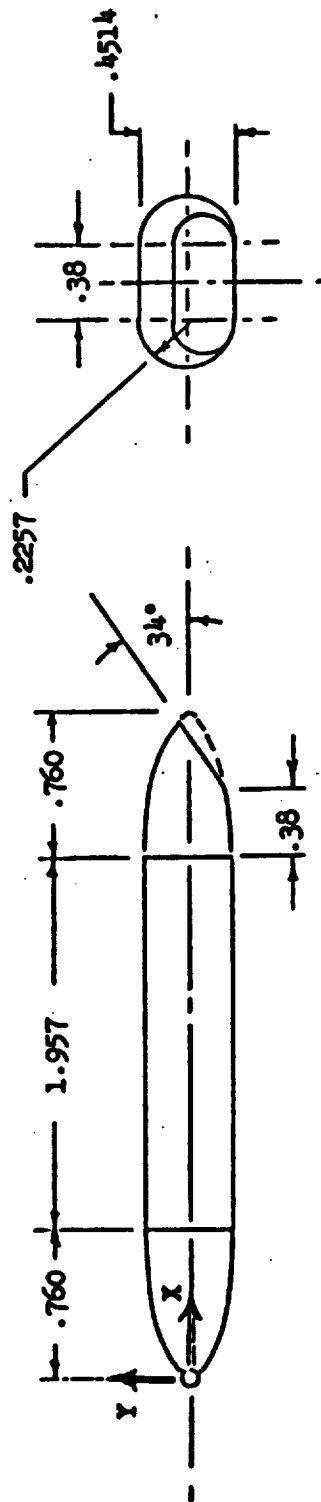


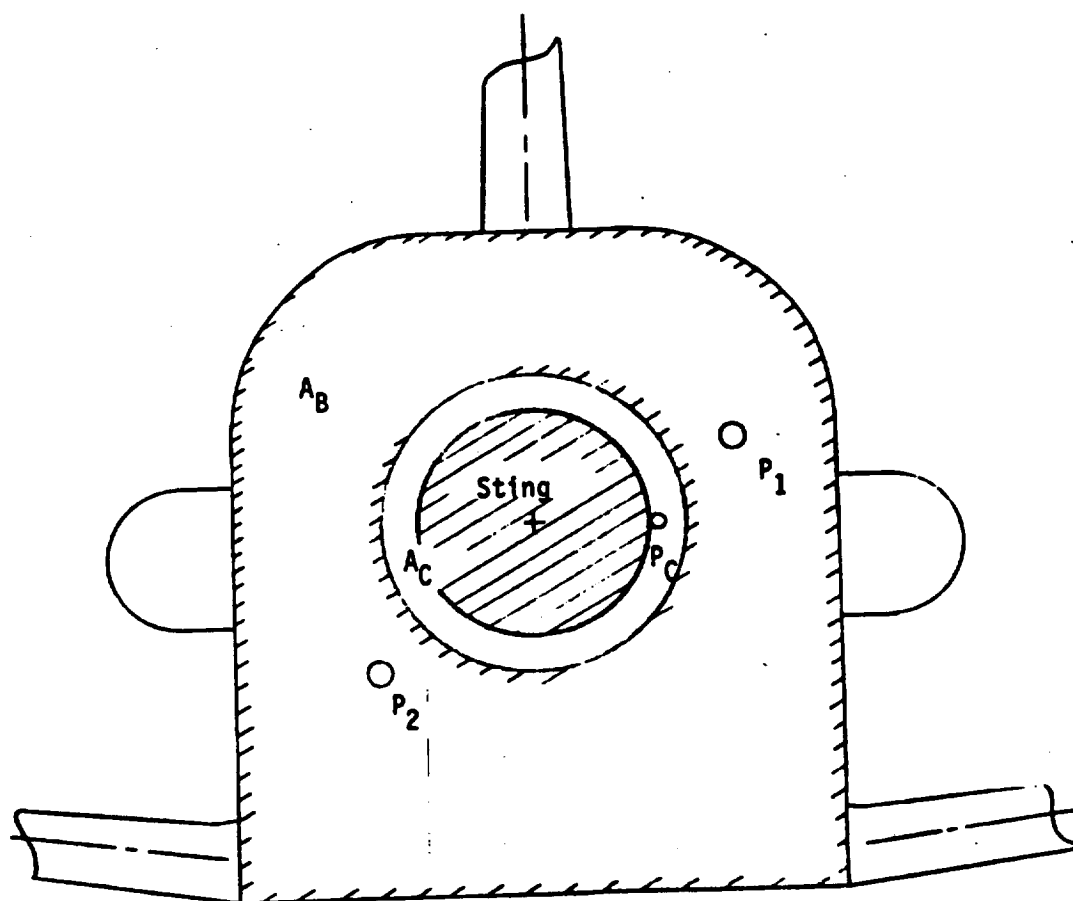
FIGURE 9. P1V - BASELINE VERTICAL TAIL (V1) ACPS POD

Figure 10. Base and Cavity Pressure Instrumentation

$$C_{AB} = \frac{1}{qS} \left[\frac{P_1 + P_2}{2} A_B + P_C A_C \right]$$

$$A_B = 12.24 \text{ in.}^2$$

$$A_C = 3.14 \text{ in.}^2$$



Note: View looking upstream.

Figure 11. Wing-Upper-Surface Flap Y1 on Baseline Wing

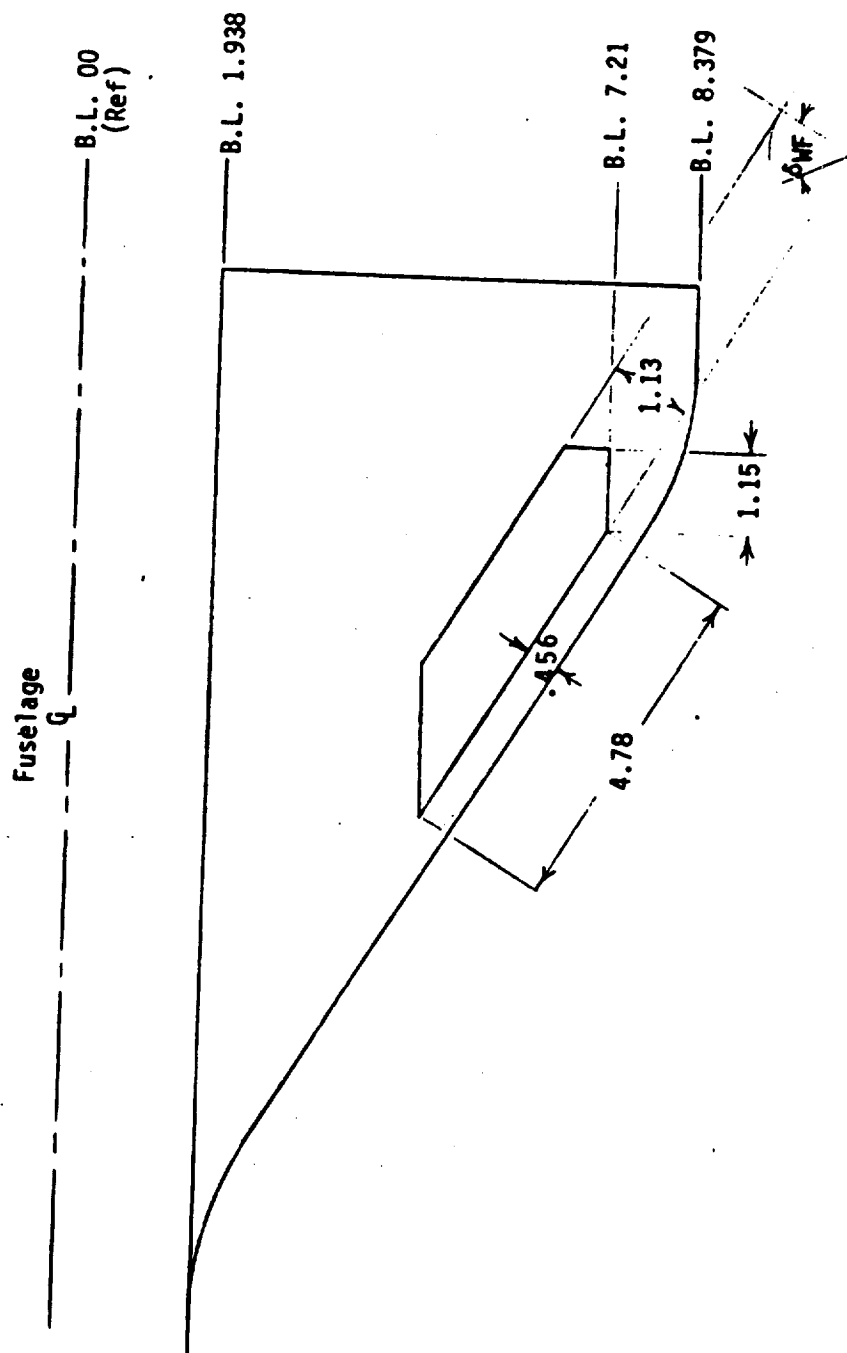


Figure 12. Wing-Upper-Surface Flap Y2 on Baseline Wing

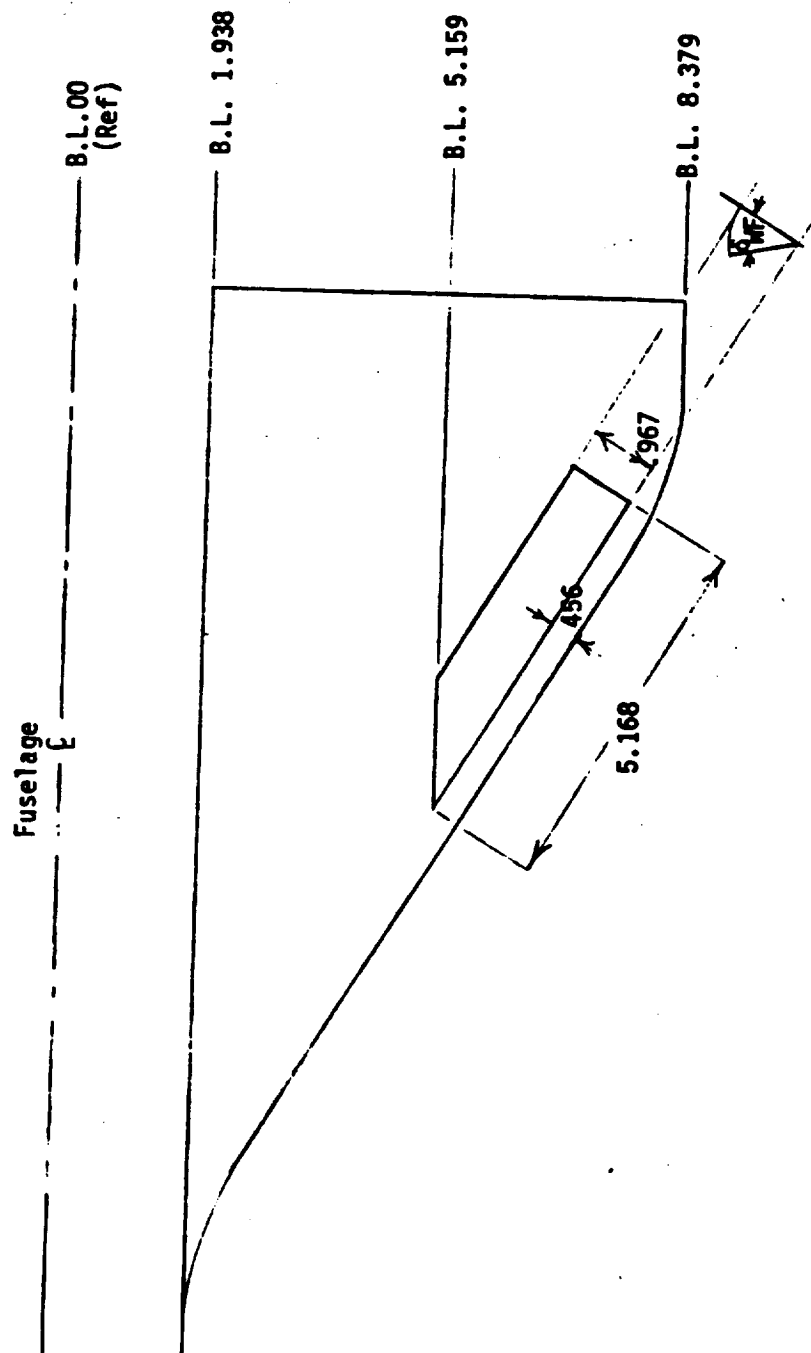
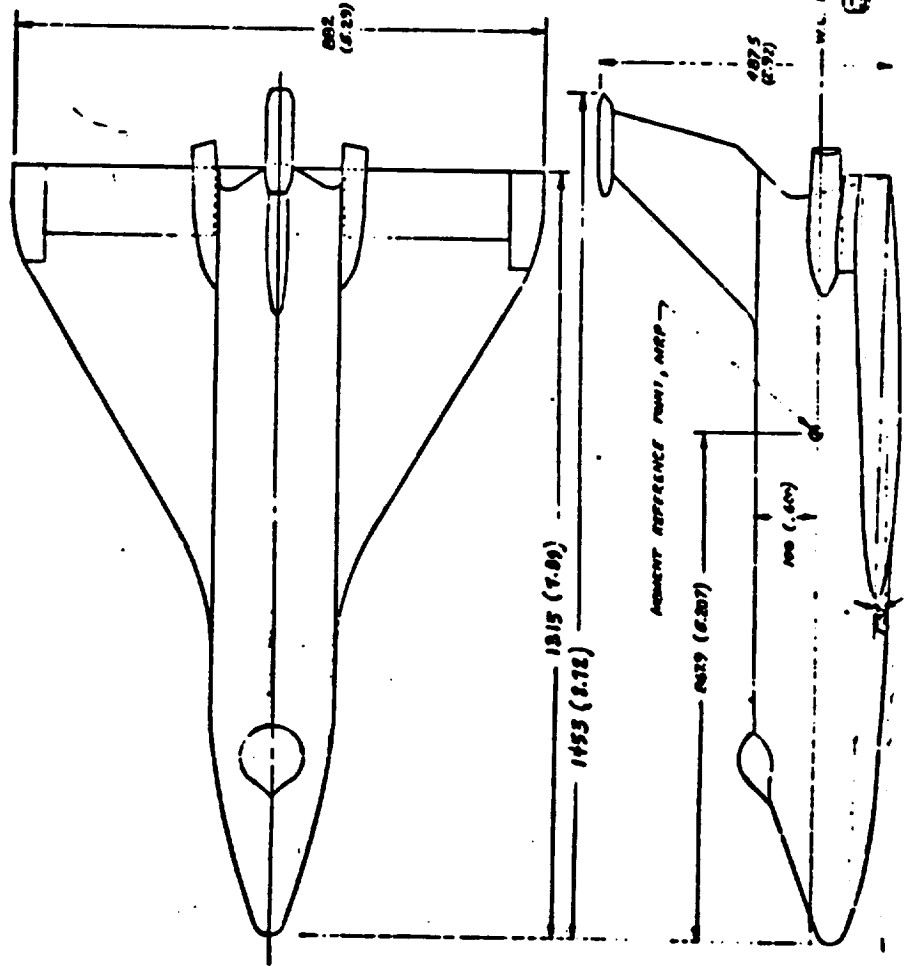


FIGURE 2. GENERAL ARRANGEMENT, 040A ORBITER



NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MODEL VALUES ARE SHOWN IN PARENTHESES.

ORIGINAL PAGE IS
OF POOR QUALITY

FIGURE 2.

DELTA WING ORBITER
MSC
DR#1274 B-1- 473

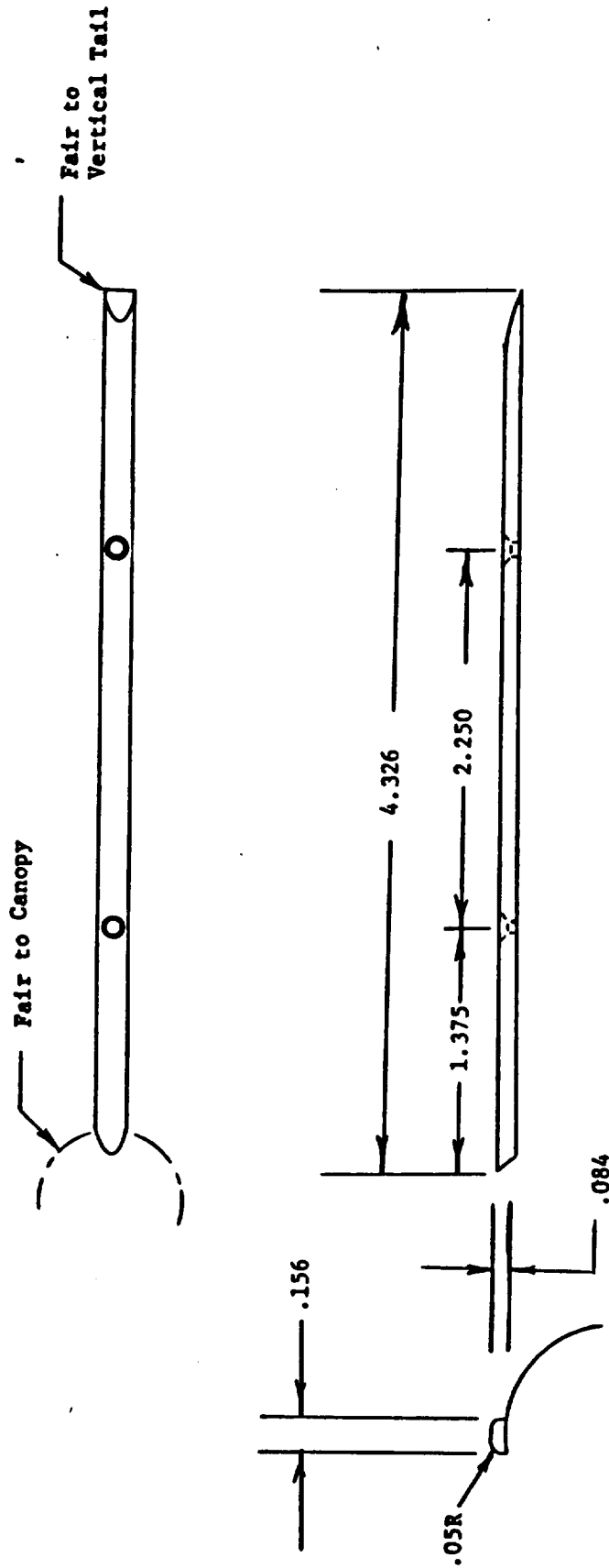
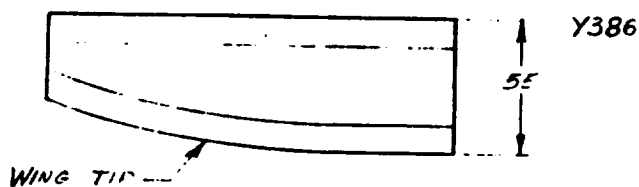


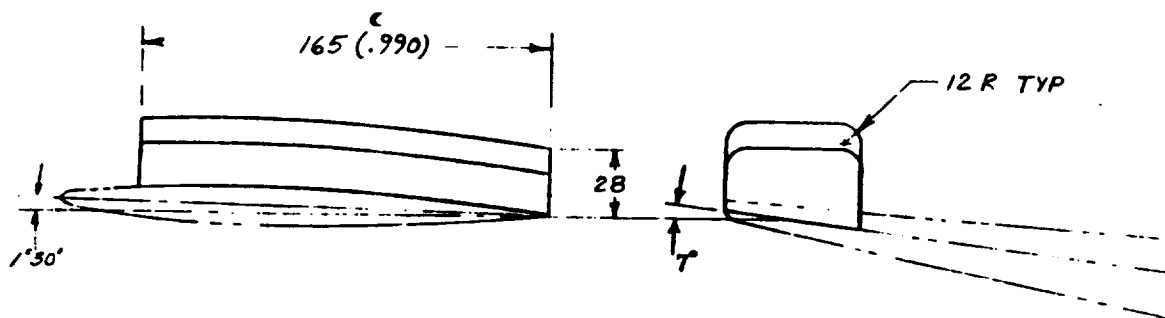
Figure 5. MANIPULATOR ARM DORSAL HOUSING (D₁)

Figure 6. ACPS (P_1) and OMS (M_1) Engine Pods

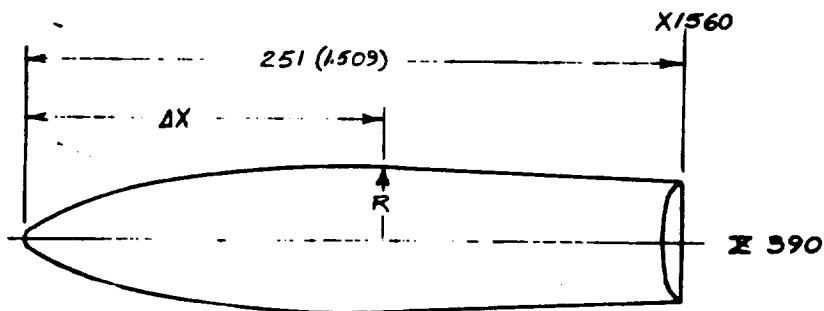
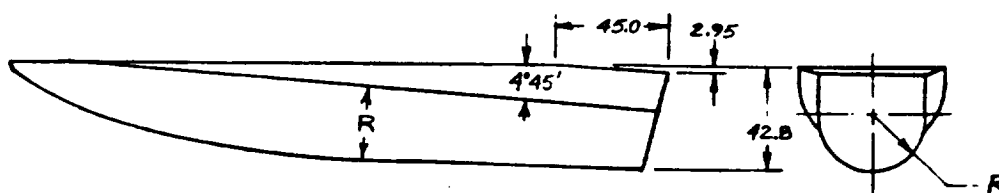
ACPS ENGINE POD ~ P1



NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN IN PARENTHESIS.



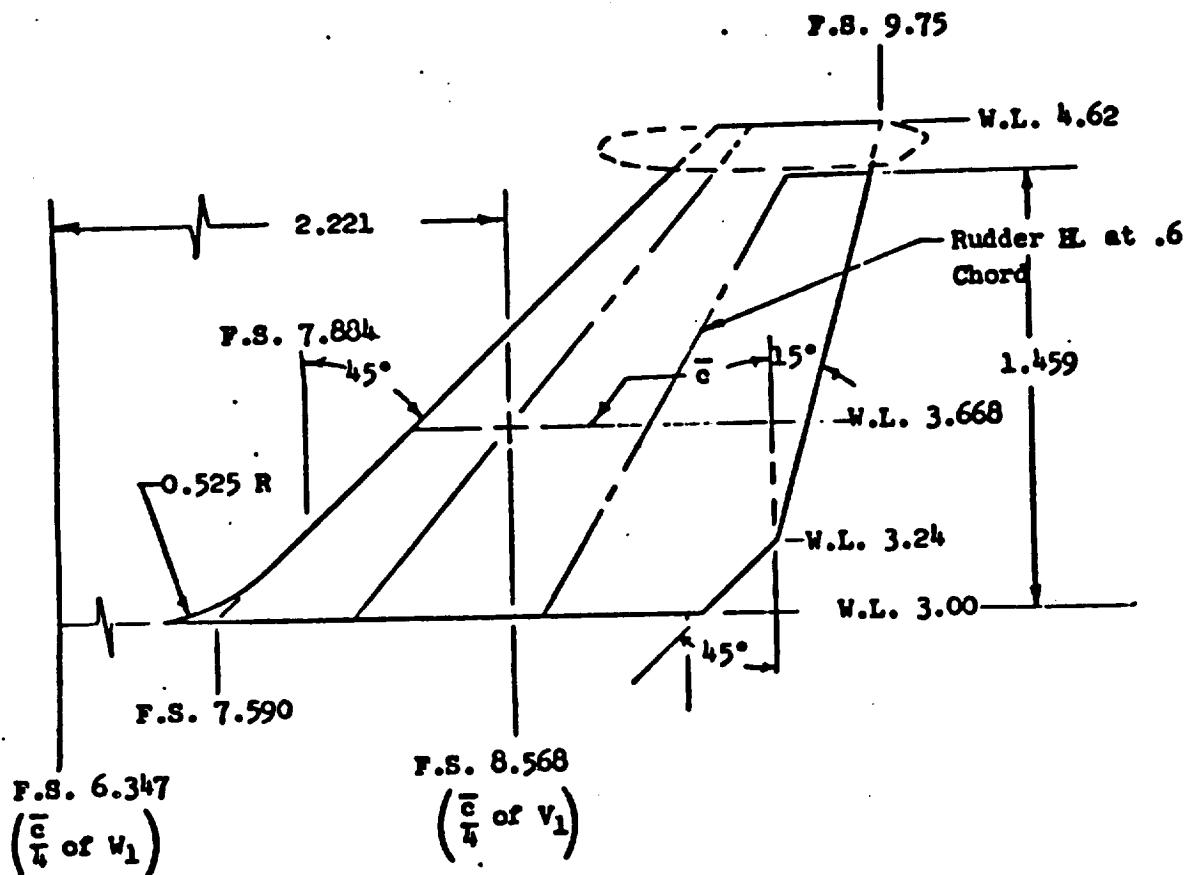
OMS ENGINE POD ~ M1



ΔX	R
0	0
25.0	15.0
58.3	28.7
75.0	28.0
100.0	29.5
133.0	29.2
245.0	24.0

FIGURE 7 - V_1 And V_9 VERTICAL TAIL AND RUDDER

$S_v = 1.837 \text{ in.}^2$	$C_R = 1.728$
$b = 1.620$	$C_T = 0.540$
$\bar{c} = 1.238$	$\lambda = .31$
$AR = 1.43$	$\Lambda_{L.E.} = 45^\circ$



Notes: All dimensions are model scale in inches.
Vertical tail attached at B.L. 0.00.

FIGURE 8. WING AND ELEVON ~ WI

DELTA WING ORBITER
MSC
DR#1274 B-1- 478

NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
2. MODEL VALUES ARE SHOWN
IN PARENTHESIS.

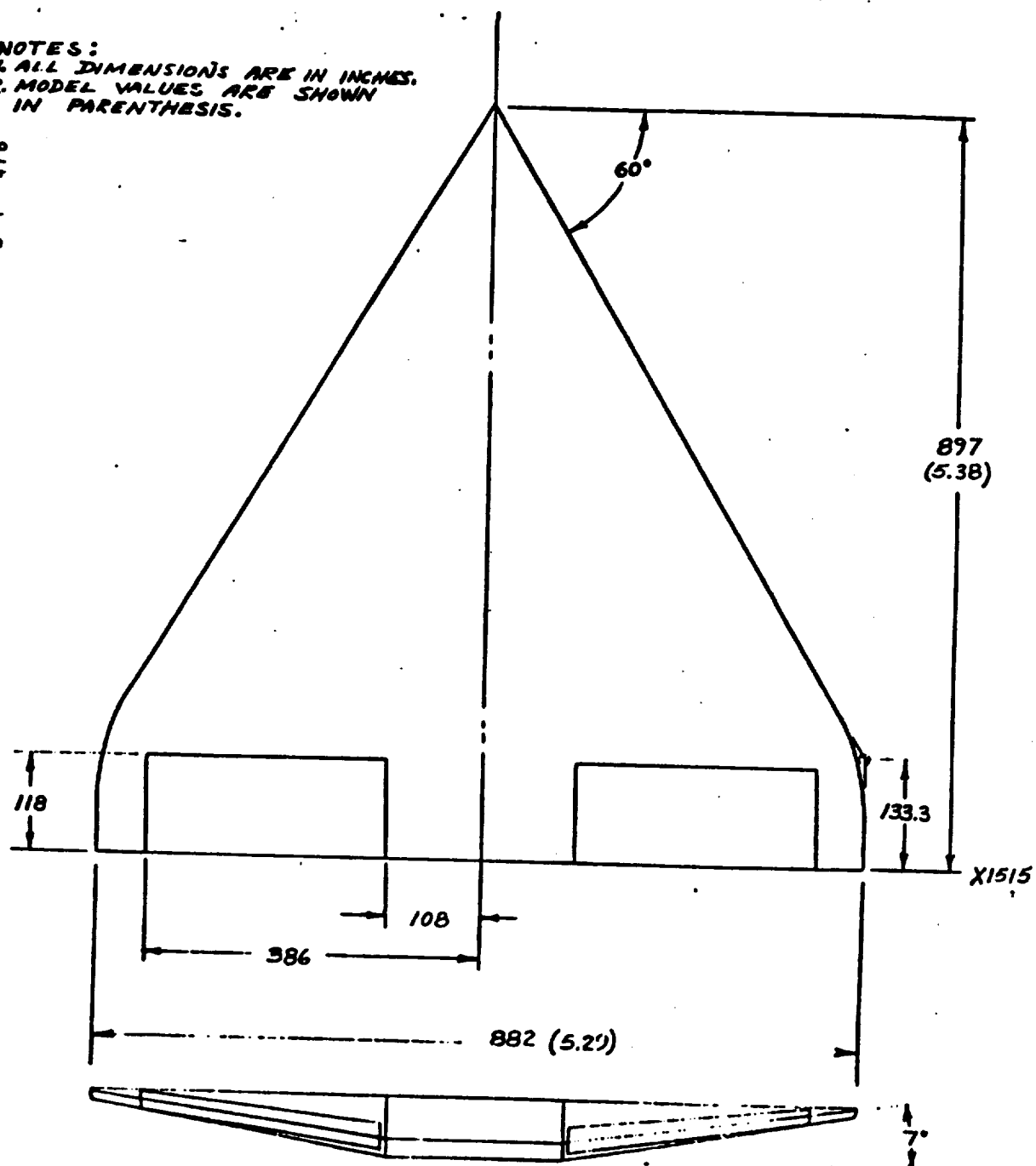


FIGURE 8

TEST 6x6- 484 DATA SET COLLATION SHEET

JANESON
SHEET 1/2

☐ PRETEST

☒ POSTTEST

RUN NUMBERS

DATA SET IDENTIFIER	CONFIGURATION	Code	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS					
			a	B	d _e	d _f			.25	.60	.90	1.1	1.5	2.0
RA3011	B	1	A	O	OFF	OFF	3		1			3	2	
012	↓	↓	B	1	↓	↓	3		57			56	55	
021	BW3EO	2	A		O		5		4	8	7	6	5	
022	↓	↓	B		↓	↓	5		54	53	52	51	50	
031	BWVEO	3	A		↓	O	6	15	14	13	12	11	10	
041	BWVE-15	4	A		-15	↓	5		20	19	18	17	16	
051	BWVE-30	5	A		-30		3			23		22	21	
032	BWVE0	3	B		O		6	43	42	41	40	39	38	
052	BWVE-30	5	B		-30		3			46		45	44	
062	BWVE-45	6	B		-45		3			49		48	47	
071	BW4V9EO	7	A		O		5		29	28	27	25	24	
072	↓	↓	B		↓	↓	5		62	61	60	59	58	
081	BW5	8	A		↓	OFF	5		34	33	32	31	30	
091	BWVEOT	9	A	↓	O		3	37	36	35				
023	BW3EO	2	B	5	OFF		5		88	87	86	85	84	
024	↓	↓	C	↓	↓	↓	5		67	66	65	64	63	
033	BWVEO	3	B		O		6	94	93	92	91	90	89	
034	↓	↓	C		↓		6	73	72	71	70	69	68	
103	BWV3EO	10	B		↓		5		104	103	102	101	100	
104	↓	↓	C	↓	↓	↓	5		83	82	81	80	79	

COEFFICIENTS: CN CA CAB CLM CY CYN CBL BETA

A = -3, -1, 1, 3, 5, 7, 9, 11, 15, 19, 23, 25° 12 PIS
B = 27, 31, 35, 39, 43, 47, 51, 55° 8 PIS
C = -3, 0, 4, 8, 12, 16, 20, 25° 8 PIS

NDV

DELTA WING ORBITER
NR
DR#1021 B-1- 479

ORIGINAL PAGE 18
OF POOR QUALITY

JAXELSON
 SHEET 2/2

TEST 6x6-484 DATA SET COLLATION SHEET

	PRETEST	POSTTEST
1. The purpose of this study was to determine the effect of the intervention on the dependent variable.		
2. The independent variable was manipulated in a controlled manner.		
3. The dependent variable was measured using a standardized scale.		
4. The results of the study indicated a significant difference between the groups.		
5. The findings suggest that the intervention had a positive impact on the outcome.		
6. The study was limited by a small sample size and a lack of randomization.		
7. Future research should explore the long-term effects of the intervention.		
8. The study was approved by the Institutional Review Board.		
9. The data were analyzed using statistical software.		
10. The results are consistent with previous research in this area.		

[illegible]

	1	7	13	19	25	31	37	43	49	55	61
COEFFICIENTS:	EN	CA	CAE	CLM	EX	CYN	CBL	BLA			

SCHEDULES

A = -3, -1, 1, 3, 5, 7, 9, 11, 15, 19, 23, 25°

B = 27, 31, 35, 39, 43, 47, 51, 55°

C = -3, 0, 4, 8, 12, 16, 20, 25°

AND

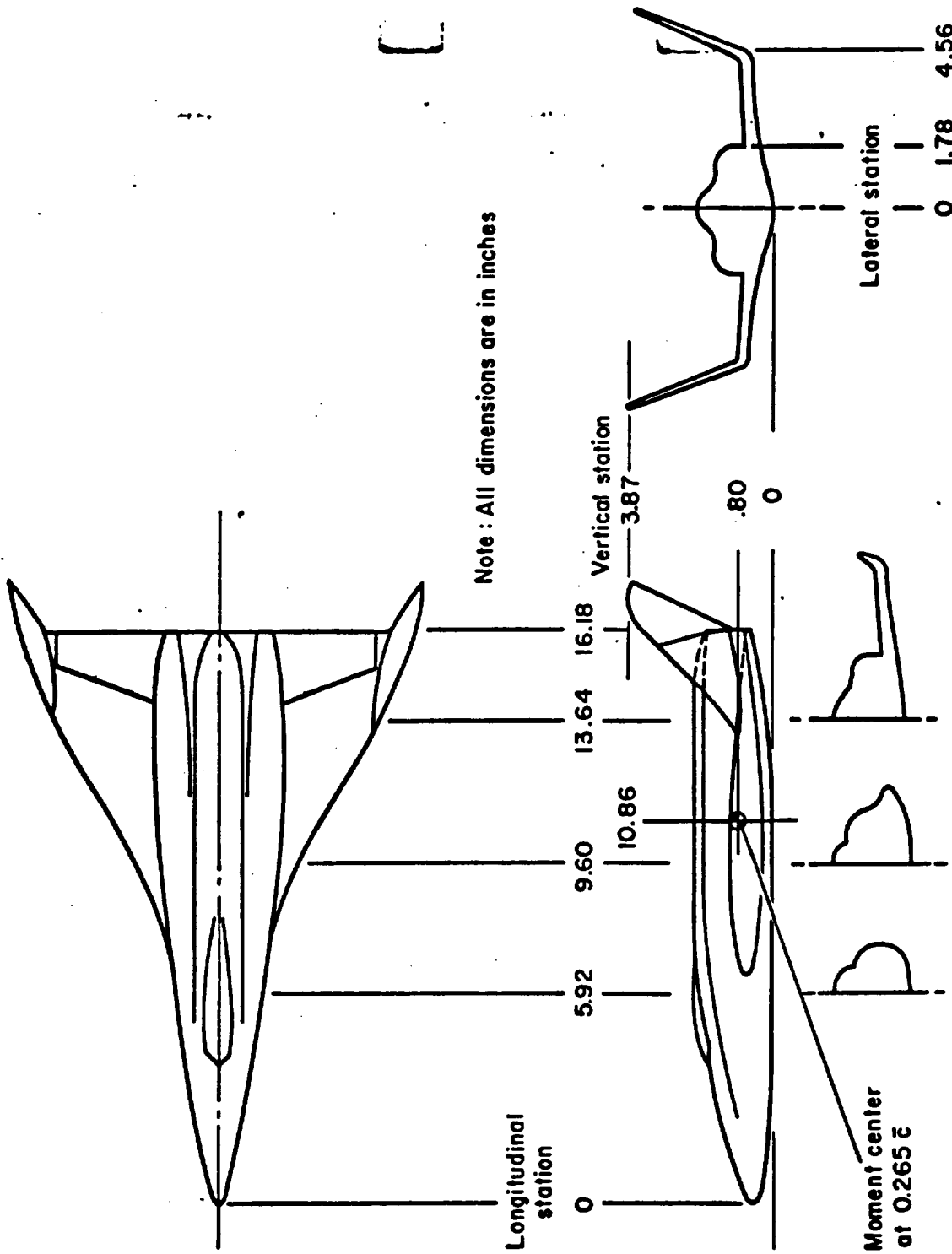


FIGURE 2. THREE VIEW DRAWING OF THE 0.008-SCALE MODEL
OF THE NORTH AMERICAN ROCKWELL SSV-129 ORBITER

DELTA WING ORBITER
NR
DR#1021 B-1- 481

DELTA WING ORBITER
NR
DR#1021 B-1- 462

NOTE: ALL DIMENSIONS IN INCHES

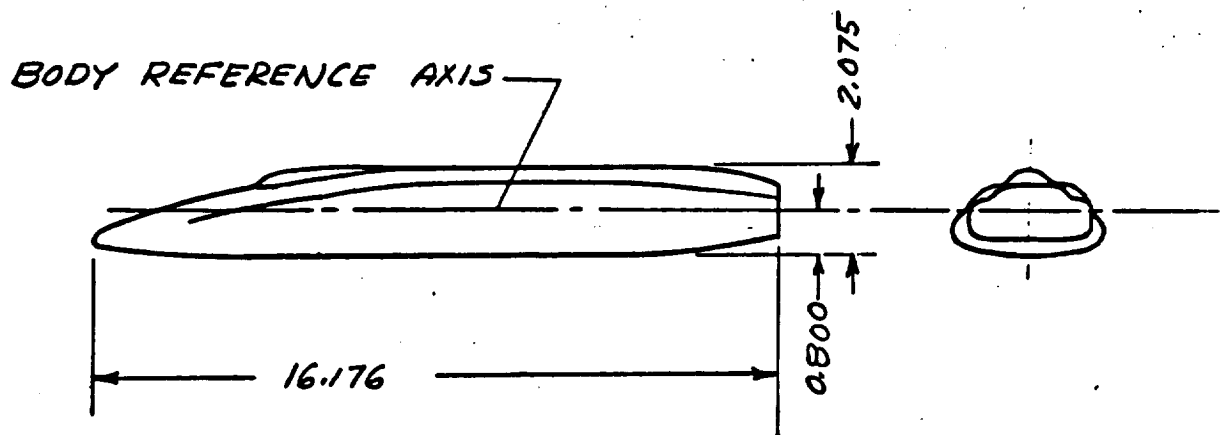
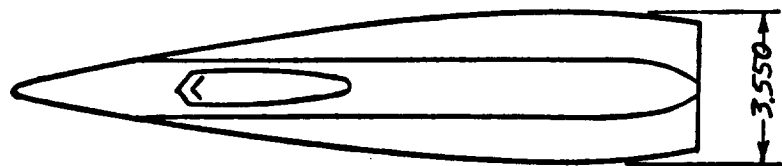
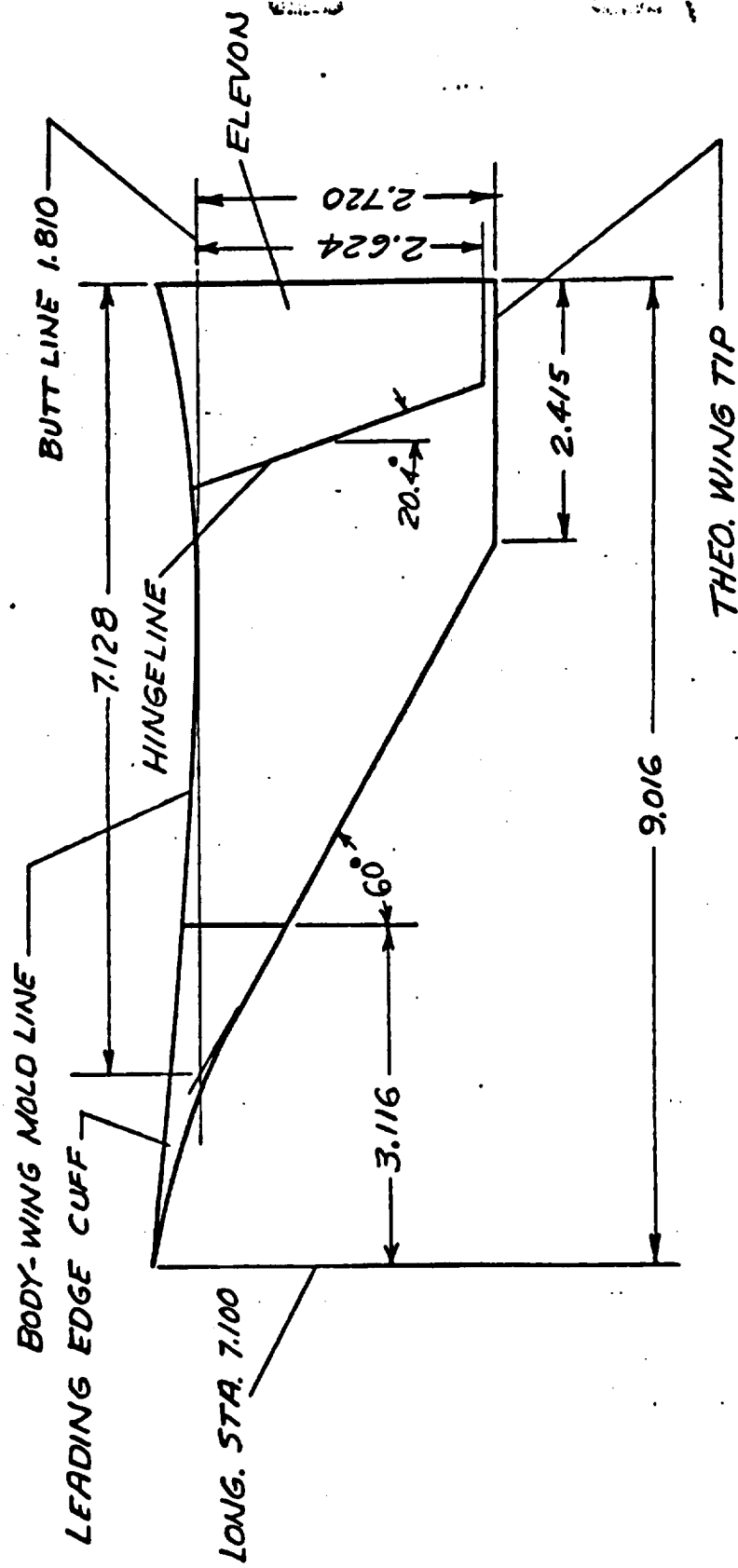


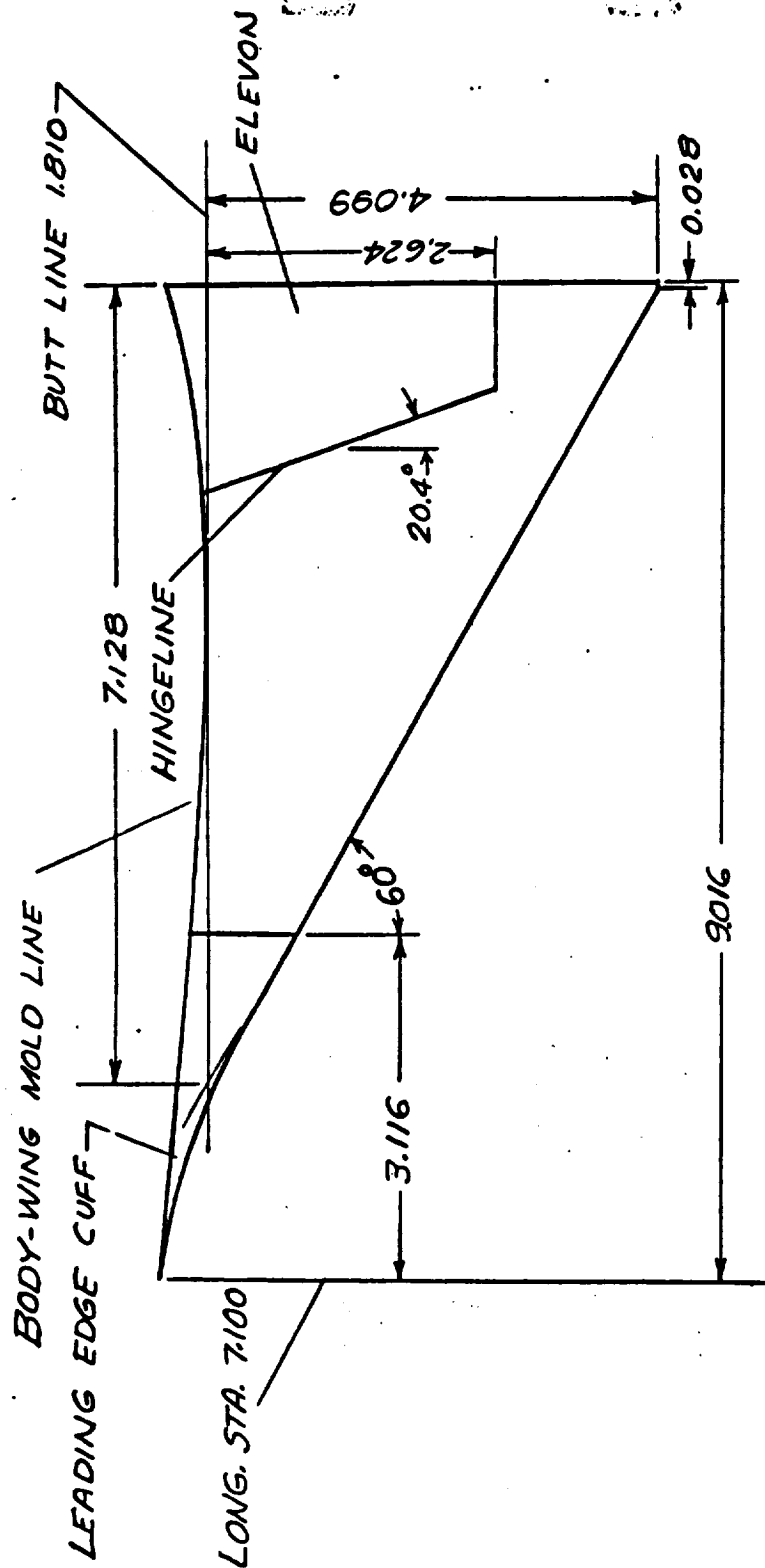
FIGURE 3. BODY B
DRAWING NUMBER NAR 9992-129



NOTE: ALL DIMENSIONS IN INCHES

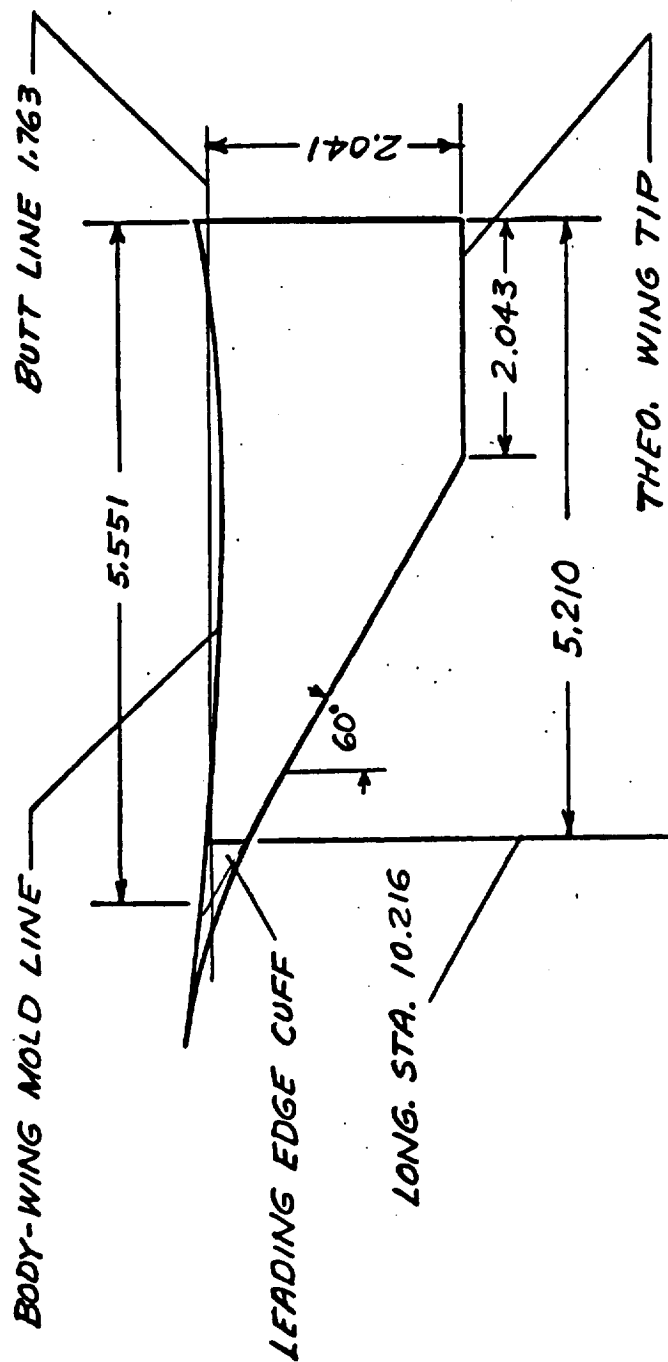
FIGURE 4. WING W WITHOUT VERTICAL TAIL
DRAWING NUMBER NAR 9992-129

DELTA WING ORBITER
NR
DR#1021 B-1- 483



NOTE: ALL DIMENSIONS IN INCHES

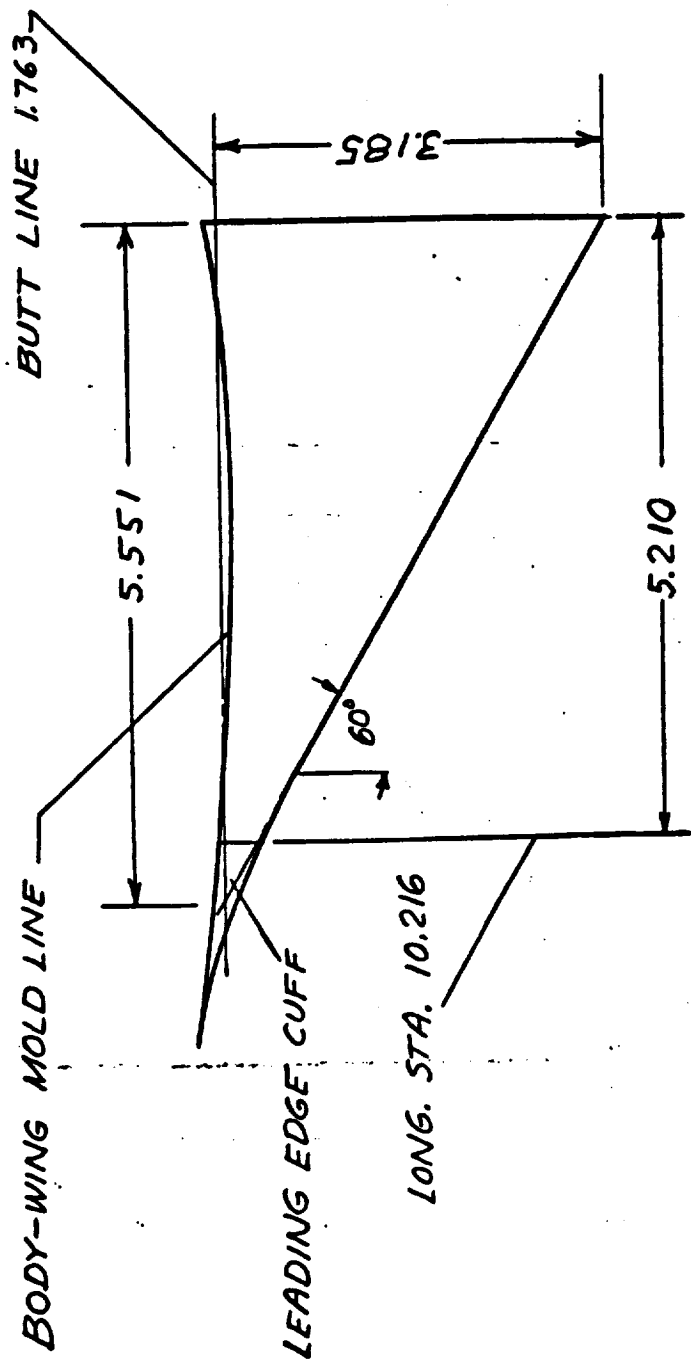
FIGURE 5. WING W₃
 DRAWING NUMBER NAR 9992-129



NOTE: ALL DIMENSIONS IN INCHES

FIGURE 6. WING W₄
DRAWING NUMBER NAR 9992-129E

DELTA WING ORBITER
NR
DR#1021 B-1- 485



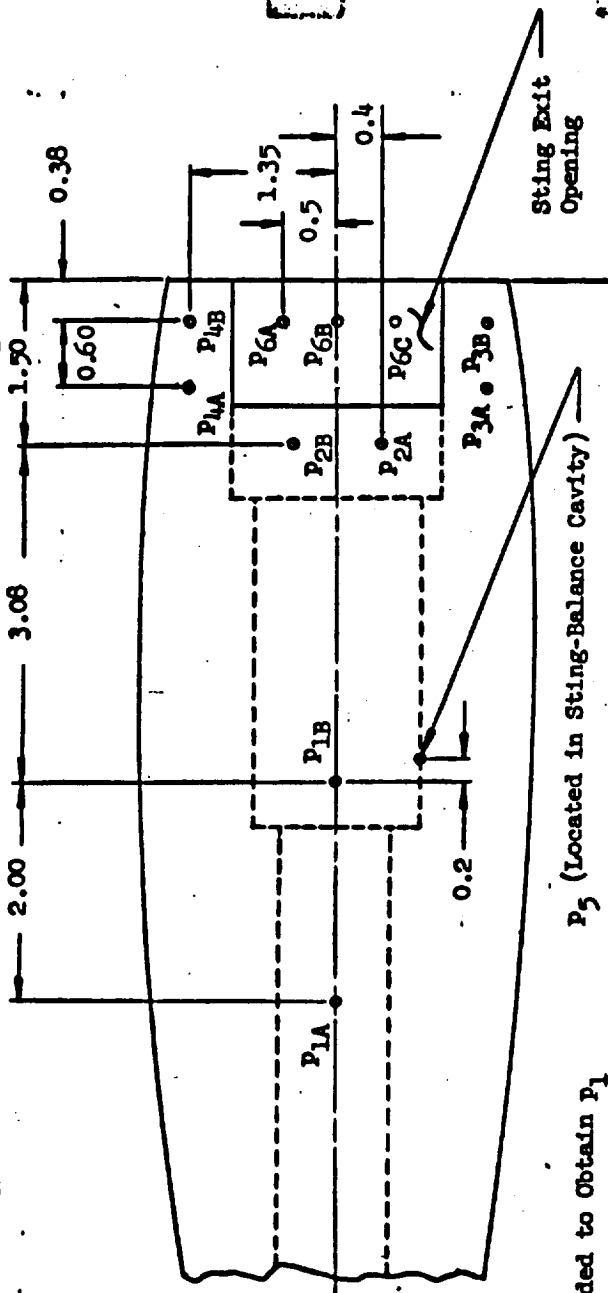
NOTE: ALL DIMENSIONS IN INCHES

FIGURE 7. WING W5
DRAWING NUMBER NAR 9992-129E

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AMES RESEARCH CENTER
Aeronautics Division

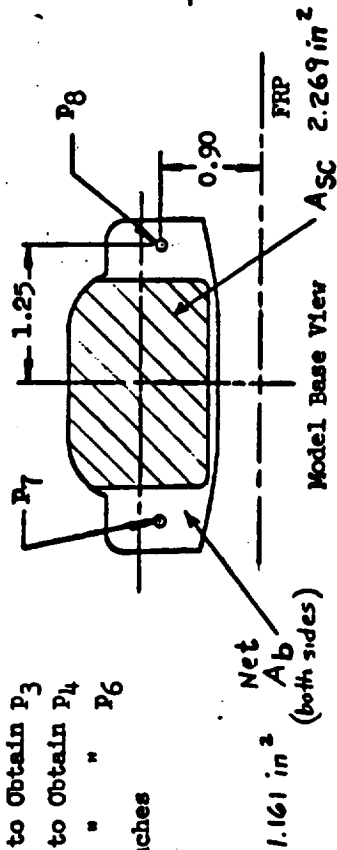
Model: MA-129 SSV Orbiter

Test No. 66-484



Note:

1. P_{1A} & P_{1B} Manifoldd to Obtain P₁
2. P_{2A} & P_{2B} Manifoldd to Obtain P₂
3. P_{3A} & P_{3B} Manifoldd to Obtain P₃
4. P_{4A} & P_{4B} Manifoldd to Obtain P₄
5. P_{6A}, P_{6B} & P_{6C} " " " P₆
6. All Dimensions in Inches

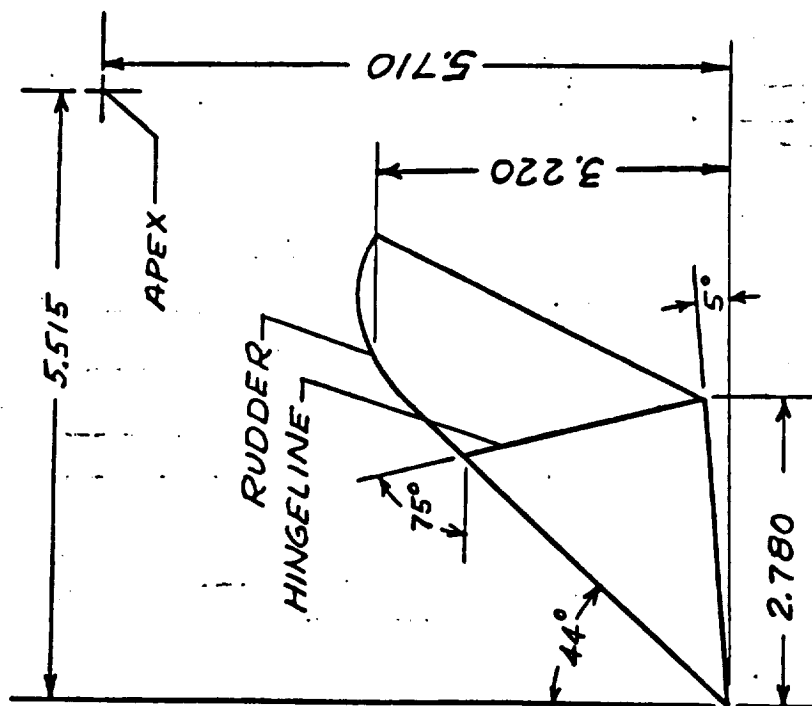


$$\text{Total } A_b = 3.430 \text{ in.}^2 = A_{b \text{ net}} + A_{sc}$$

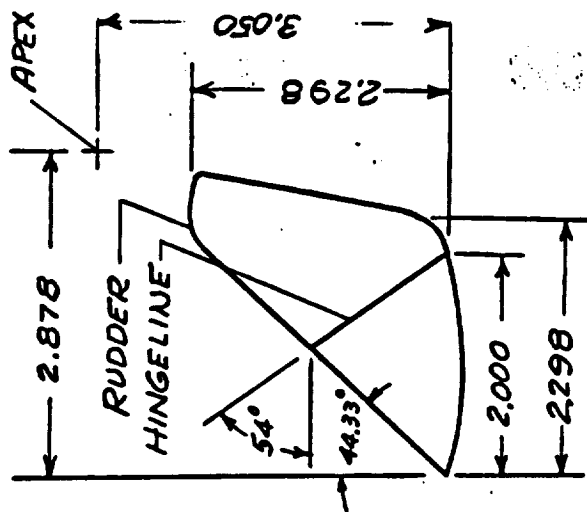
Figure 8 Location of Static Pressure Orifices

DELTA WING ORBITER
NR
DR#1021 B-1-487

NOTE: ALL DIMENSIONS IN INCHES



TAIL V AND V₃



TAIL V₉

FIGURE 9. VERTICAL TAILS V AND V₉
DRAWING NUMBER NAR 9992-129E

TEST 6x6-503 DATA SET COLLATION SHEET

SHEET 1 OF 2

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. a	PARAMETERS/VALUES		NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						
			δ_b	δ_c		0.6	0.9	1.2	1.5	2.0		
RAE011	B6	A0	-		5	55	54	53	52	51		
012	B6	B0	-		5	10	9	8	7	6		
021	B8	A0	-		5	60	59	58	57	56		
022	B8	B0	-		5	5	4	3	2	1		
031	B6W10	A0	-		5	50	49	48	47	46		
032	B6W10	B0	-		5	15	14	13	12	11		
041	B6W10H12	A0	0		5	45	44	43	42	41		
042	B6W10H12	B0	0		5	21	20	19	18	17		
052	B6W10H12	B0	-20		5	26	25	24	23	22		
062	B6W10H12	B0	-30		5	31	30	29	28	27		
072	B6W10H12	B0	-50		4	-	35	34	33	32		
047	B6W10H12	20K	0		5	100	99	98	97	96		
049	B6W10H12	60K	0		5	105	104	103	102	101		
081	B6W10H13	A0	0		5	65	64	63	62	61		
082	B6W10H13	B0	0		5	40	39	38	37	36		
091	B6W10H12V5	A0	0		5	70	69	68	67	66		
093	B6W10H12V5	C0	0		5	90	89	88	87	86		
101	B6W10H12V5	A0	10		5	75	74	73	72	71		
111	B6W10H12V5	A0	-10		5	80	79	78	77	76		
121	B6W10H12V5	A0	-30		5	85	84	83	82	81		

1 7 13 19 25 31 37 43 49 55 61 67 73 79

CN CA CAB CLM CY CYN CBL
COEFFICIENTS: A = -6, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 (10 PTS) E = -15, -12, -8, -4, -2, 0, 2, 4, 6, 8, 10 (11 PTS)
a or B B = 45, 50, 54, 60, 64, 67 (6 PTS) F = 12, 15, 18, 21, 24, 27, 30, 33, 36, 40 (10 PTS)
SCHEDULES C = -15, -12, -8, -4, -2, 0, 2, 4, 6, 8, 10 (11 PTS) K = -5, -2, 0, 2, 4, 6, 10 (7 PTS)

DELTA WING ORBITER
NR
DR#1026 B-1- 489

ORIGINAL PAGE IS
OF POOR QUALITY

NAR Delta-wing orbiter model for Ames 6' x 6' wind tunnel tests

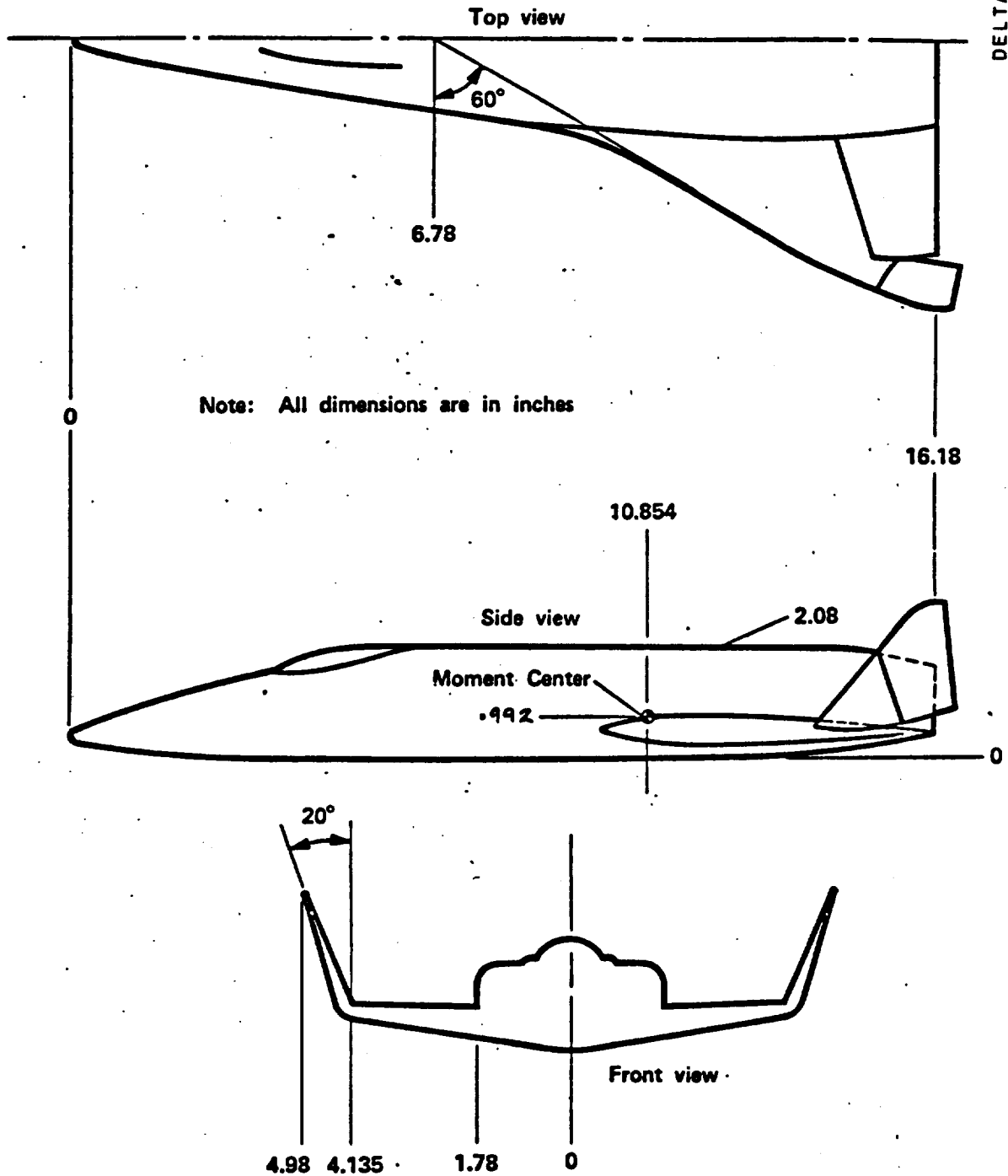


Figure 5.- NAR Delta Wing Orbiter, Three-View

TEST TWT-468 DAT. SET COLLATION SHEET

Force-Delta Wing Orbiter, 0.0035-scale. Stability and Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION					NO. OF RUNS	MACH NUMBERS						
		α	β	δE	δA	δy	0.6	0.9		1.2	1.46	1.96	2.99	4.96		
02107A	BSW13E2V14R4	A	0	-15	0	0										
07D		D											026/6			
07E		E											183/6			
08A		A		-30									182/6			
08B		D											027/6			
08E		E											124/6			
10A		A		-45									129/6			
10B		D											028/6			
10E		E											125/6			
11A		A		0		-15							128/6			
11B		D											029/6			
11E		E											126/6			
01M	BS	O	A										127/6			
01N		15											054/6			
014		30											055/6			
01P		45											056/6			
02M	BSW13E2	O		0		0							057/6			
02N		15											053/6			
024		30											059/6			
02P		45											079/6			
													078/6			

COEFFICIENTS: $C_L = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20$
 $C_D = 20, 32, 44, 46, 48, 50, 52, 54, 56, 58, 60$
 $C_A = -4, -2, 0, 2, 4, 6, 8, 10$

$S_A = -15 = \delta E - 15L + 15R$

DELTA WING ORBITER
NR
DR#1027 8-1-493

ORIGINAL PAGE IS
OF POOR QUALITY

TEST TWT-468 DAT. SET COLLATION SHEET
Force-Delta Wing Orbiter, 0.0035-Scale. Stability and Control

☐ PRETEST

[illegible]

1	7	13	19	25	31	37	43	49	55	61	67	73%
CLM	CL	CLN	CLY	KEE	CAB	EDF	IL/D	KCP				
COEFFICIENTS: GA = -4, -2, 0, 2, 4, 6, 8, 10												
a or b												
SCHEDULES												
IDPVAR(1) IDPVAR(2) INDV												
SY - T.E. out'd, bot'l R4'S												

TEST TWT-468 DAT. SET COLLATION SHEET

Force-Delta Wing Orbiter, 0.0035-scale, stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION					NO. of RUNS	MACH NUMBERS						
		a	B	SE	SA	SV	0.6	0.9		1.2	1.4					
021 14M	05W13E2V14R4	0	A	0	-10	0	1			0.6	0.9	1.2	1.4	1.96	2.99	4.96
14N		15					1									0.42/0
14P		30					1									0.44/0
15M		45					1									0.69/0
15N		0				-20	1									0.68/0
15P		15					1									0.43/0
15N		30					1									0.65/0
15P		45					1									0.44/0
28M	05W14E3V16X	0					1			2.15/0						0.47/0
28N		15					1			2.49/0						
28P		30					1			2.14/0						
28P		45					1			2.11/0						
✓ 29M	05W14E3V17	0					5					1.70/0	1.93/0	1.98/0	0.45/0	0.44/0
29N		15					5					1.79/0	1.82/0	1.87/0	0.58/0	0.57/0
✓ 34M	05W14E3V17X	0					2			2.44/0	2.23/0					
34N		15					2			2.41/0	2.22/0					
34P		30					7			2.17/0	2.18/0	2.19/0	2.04/0	2.00/0	2.05/0	2.04/0
34P		45					7			2.10/0	2.09/0	2.08/0	2.07/0	2.01/0	2.03/0	2.02/0

COEFFICIENTS: $C_L = -0.2, C_D = 0.2, C_{L/D} = 1.0$
 SCHEDULES: $S_1 = 0.0035, S_2 = 0.0035$
 IDEVAR(1) IDEVAR(2) IDEVAR(3)

$S_2 = (-) TE \text{ right (batt.)}$

DELTA WING ORBITER
 NR
 DR#1027 B-1-495

TEST TWT-468 DAT. SET COLLATION SHEET

Force - Straight Wing Orbiter, 0.0035-Scale, Stability and Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCID.		CONTROL DEFLECTION		NO. OF RUNS	MACH NUMBERS							
		u	R	δH	δA		0.6	0.9	1.2	1.46	1.96	2.99	4.96	
221 32D	B6W10H12	D	0	-30		3					164/6	112/6	111/6	
32E	↑	E	↑	↑		2					142/6	141/6		
25A	B6W10H12VS	A		-40		3					199/6	096/6	018/6	
43D	B6W10H12X	D				2	224/6	218/6						
33D	B6W10H12	D				3					167/6	116/6	115/6	
33E	↑	E				2					138/6	137/6		
26E		↑		-50		2					149/6	148/6		
27E		↑		20		2					151/6	150/6		
34E	↑	↑		-35	-15	2					155/6	152/6		
174 B6		0	A			2					035/6	034/6		
17T B6		0	A			2					101/6	100/6		
18U B6W10		0	↑			2					031/6	030/6		
18R	↑	10	↑			2					044/6	047/6		
18T B6W10		0	A			2					095/6	094/6		
19U B6W10H12		0	↑	0		2					038/6	037/6		
19R	↑	10	↑			2					050/6	049/6		
19T B6W10H12		0	A	0		2					093/6	092/6		

CLM	7	13	19	25	31	37	43	49	55	61	67	73	79
CLM	1CL	1LM	1YM	1SL	1AB	13F	1L/D	1KCP					

COEFFICIENTS: $\alpha A = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20$
 $\alpha D = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40$
 $\alpha E = 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60$
 $\beta A = -4, -2, 0, 2, 4, 6, 8, 10$

$\delta H = -208, 50L = \delta H = -35, \delta A = -15$

DELTA WING ORBITER
 NR
 DR#1027 B-1- 497

DELTA WING ORBITER
NR
DR#1027 B-1- 498

ORIGINAL PAGE IS
OF POOR QUALITY

TEST TW-468 DAT: JET COLLATION SHEET

Force-Straight Wing Orbiter, 0.0035-Scale, Stability and Control

☐ PRETEST

☒ POSTTEST

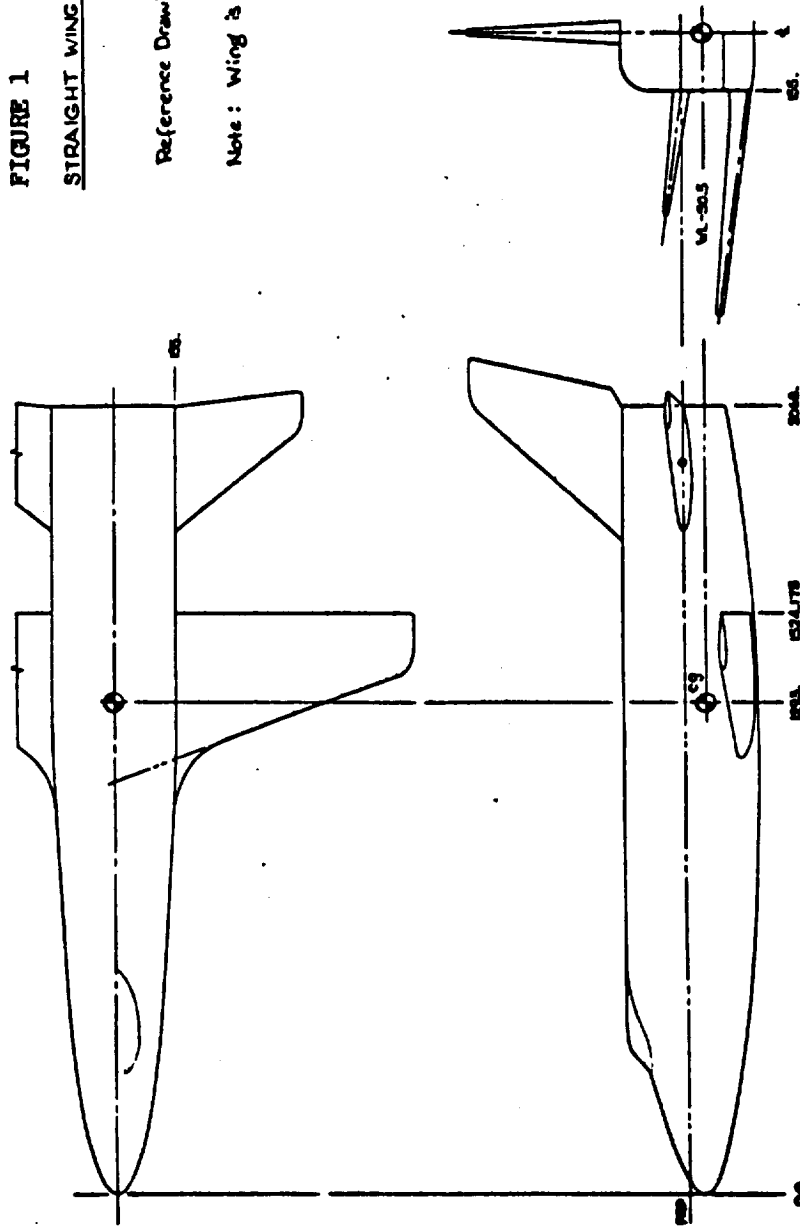
DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. OF RUNS	MACH NUMBERS					
		a	b	CN	SW		0.6	0.9	1.2	1.46	1.96	2.99
208	86W10H12VS	0	A		0	2						
445	86W10H12VSX	10			↓	2					3416/040/c	
39A	86X	20			↓	2					052/055/c	
39D		A	O	MAX		1	235/c				089/088/c	
39E		D		↓		1	231/c					
40A		E		↓		1	233/c					
40D		A		MIN		1	234/c					
40E		D		↓		1	230/c					
		E		↓		1	232/c					

7	13	19	25	31	37	43	49	55	61	67	73
CLM	ICL	ICLN	ICLY	ICSL	KAB	KDE	IL/D	KCP			
COEFFICIENTS:											
C of A = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20											
C of D = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40											
C of E = 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60											
C of A = -4, -2, 0, 2, 4, 6, 8, 10											
SCHEDULES											
IDFVAR(1) IDFVAR(2) IDFVAR(3)											

FIGURE 1
STRAIGHT WING SSV ORBITER

Reference Drawing 9992-130C

Note: Wing is in -150G position



DELTA WING ORBITER
 NR
 DR#1027 B-1- 500

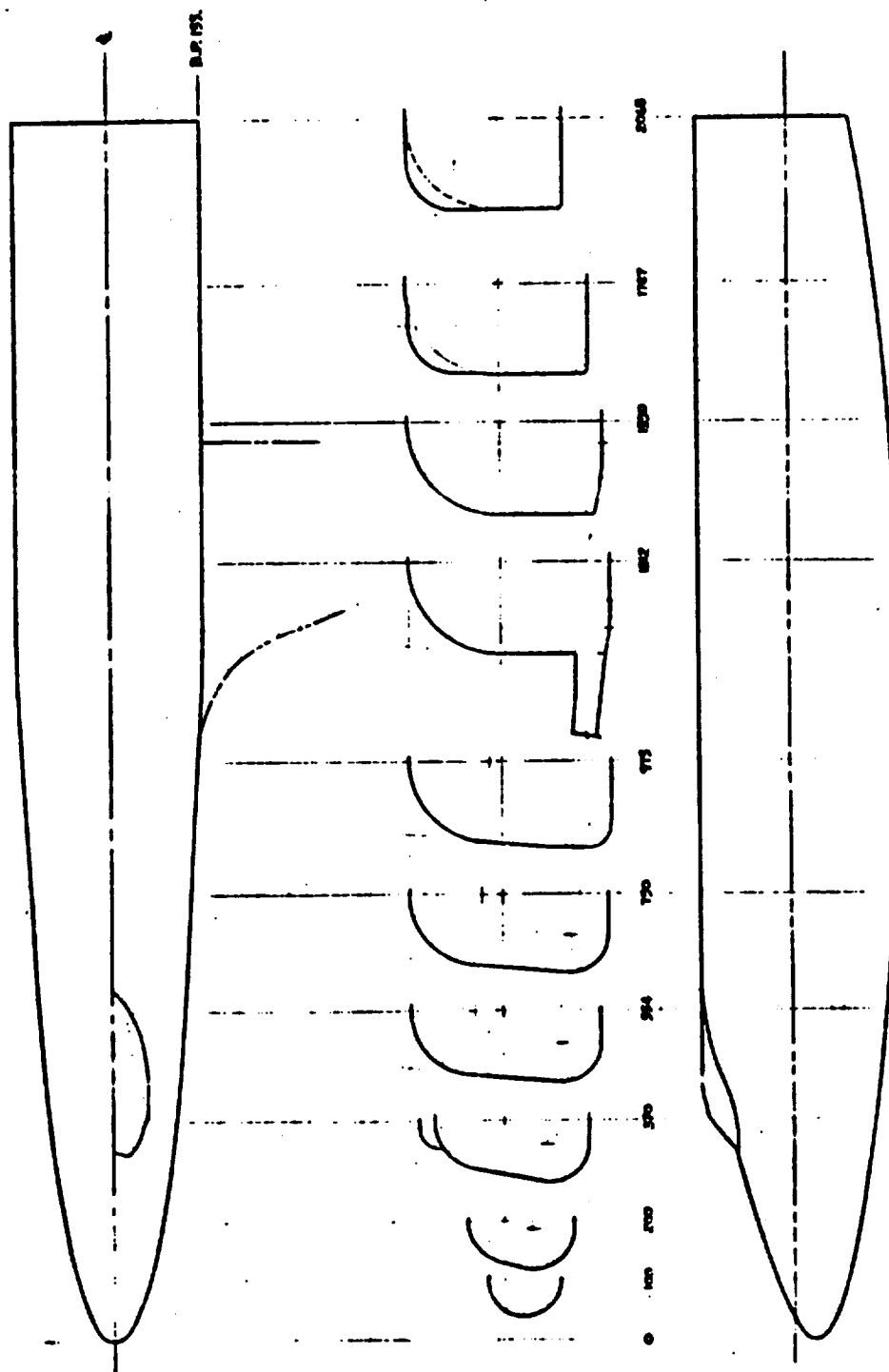


FIGURE 2 BODY B6 9992-130 C CONFIGURATION

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1027 B-1- 501

ORIGINAL PAGE IS
OF POOR QUALITY

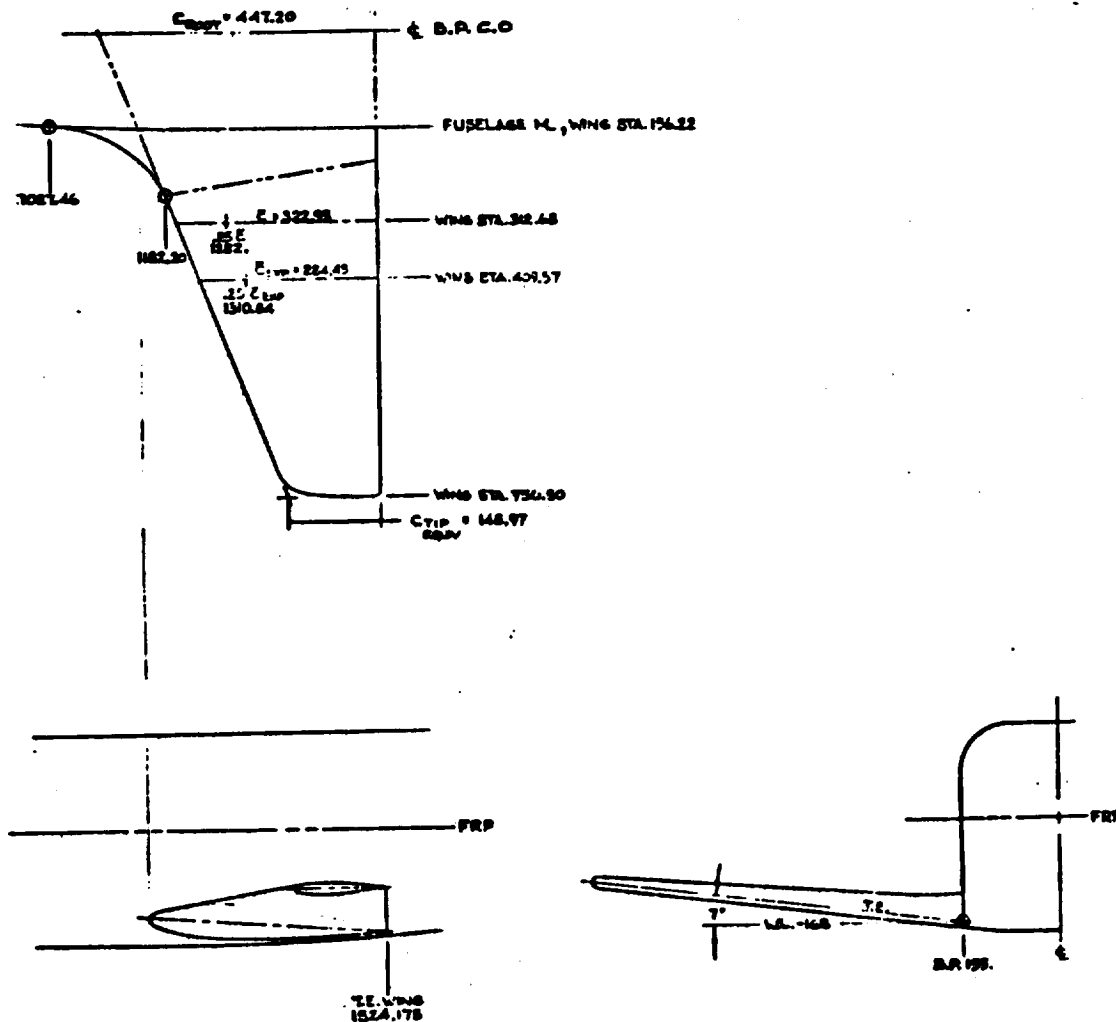


FIGURE 3 WING WIO 9992-130 C CONFIGURATION
9992-130 G WING POSITION

**LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION**

1606.01

448.03

252.00

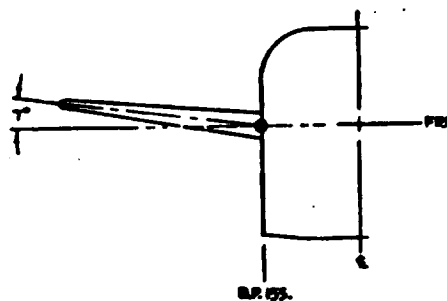
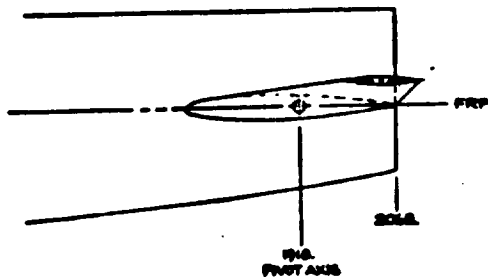
252.00 CAST

1601.02

448.03

FURGLINE M. 100.00

100.00



604

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1027 B-1- 503

ORIGINAL PAGE IS
OF POOR QUALITY

540.0
152.4
387.6 ✓

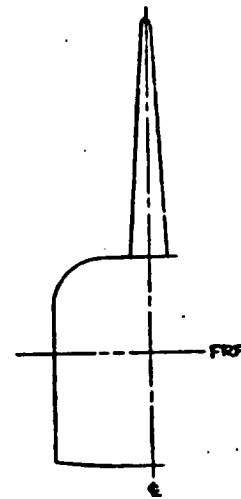
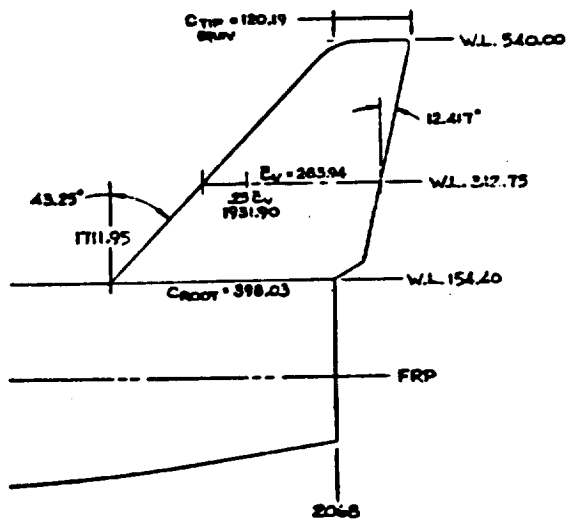
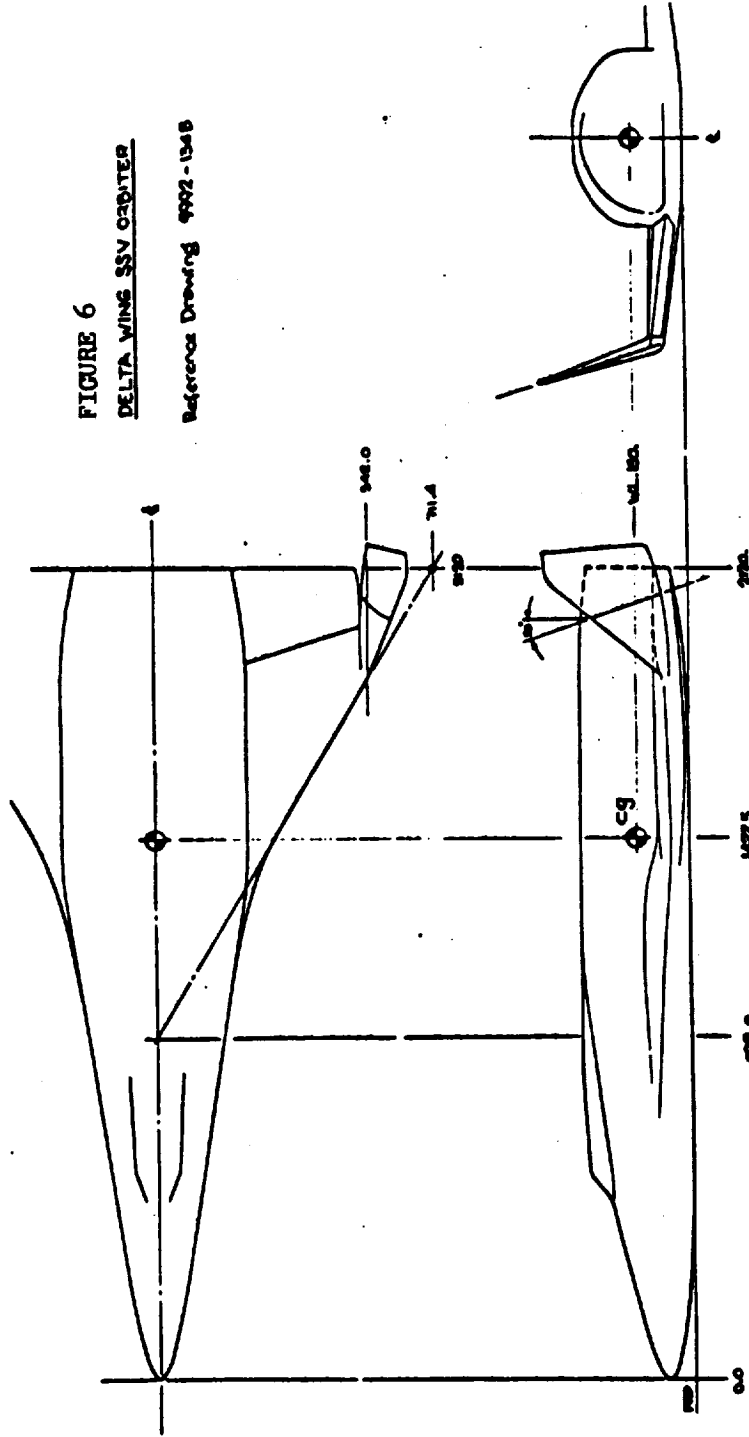
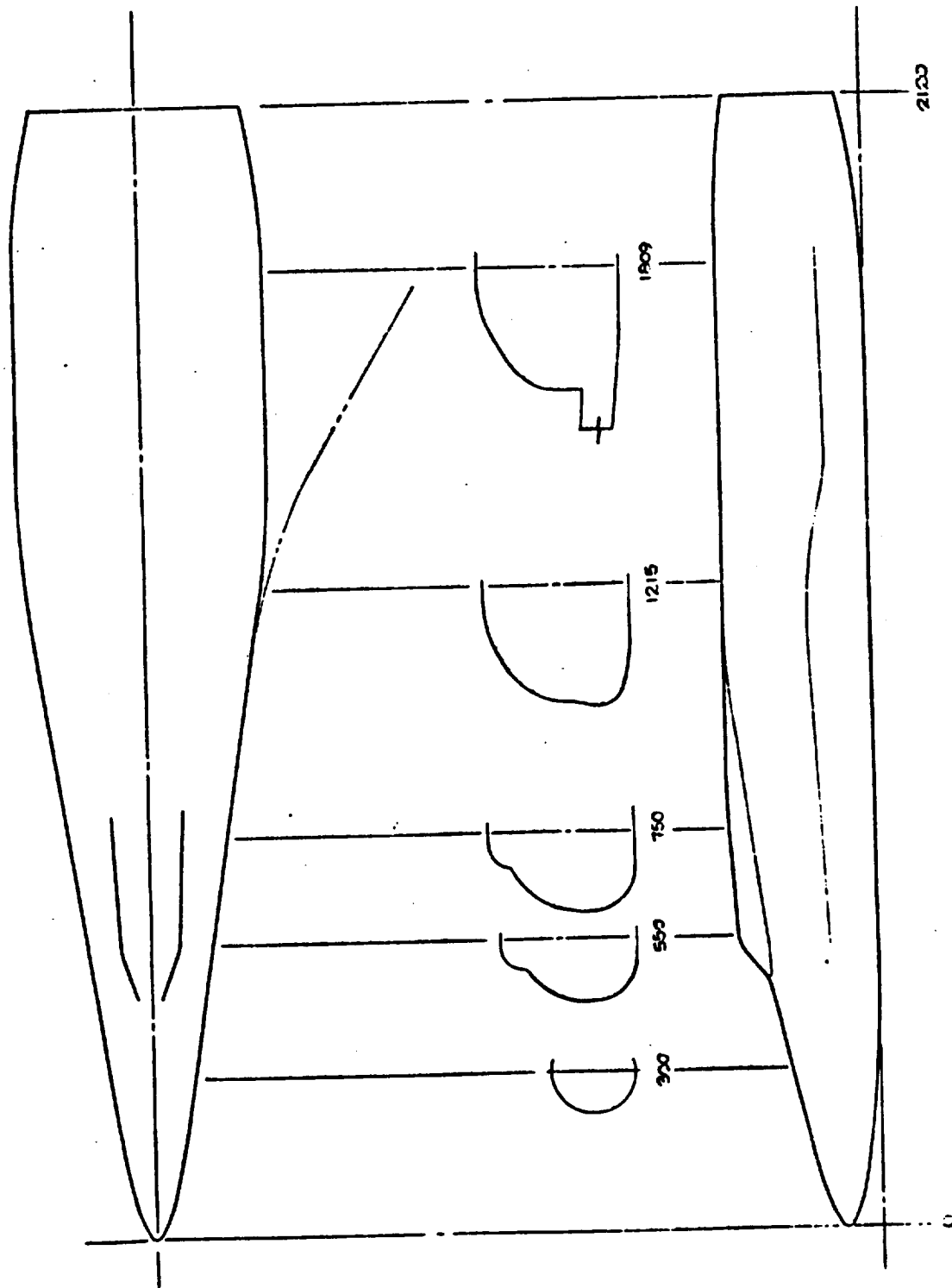


FIGURE 5
VERTICAL STABILIZER V5

9992-130 C CONFIGURATION

FIGURE 6
DELTA WING SSV ORBITER
 Reference Drawing 9902-1348



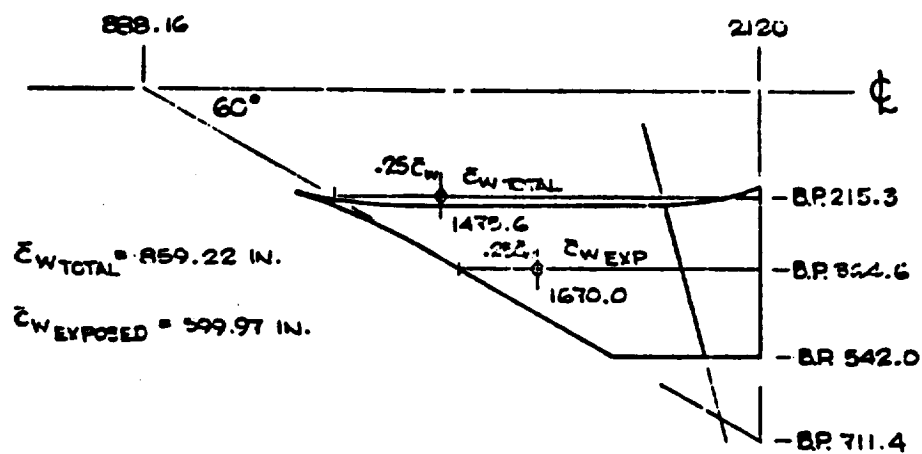


2100

FIGURE 7 BODY B5 9992 - 134 B CONFIGURATION

DELTA WING ORBITER
NR
DR#1027 B-1- 505

DELTA WING ORBITER
NR
DR#1027 B-1- 506



CHORD (B.P. 240.0)
0009 - 64 SERIES AIRFOIL



TIP CHORD (B.P. 542.0)
0012 - 64 SERIES AIRFOIL

FIGURE 8 TWISTED CLIPPED DELTA WING (W13)

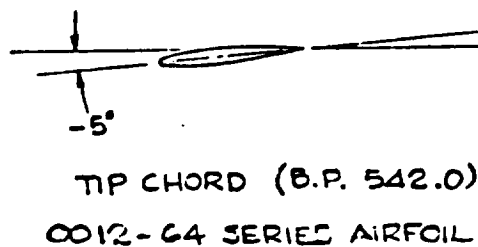
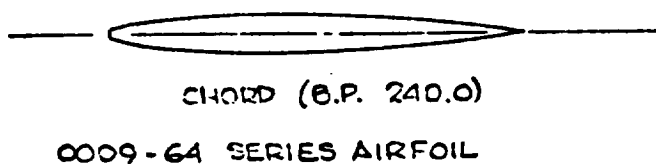
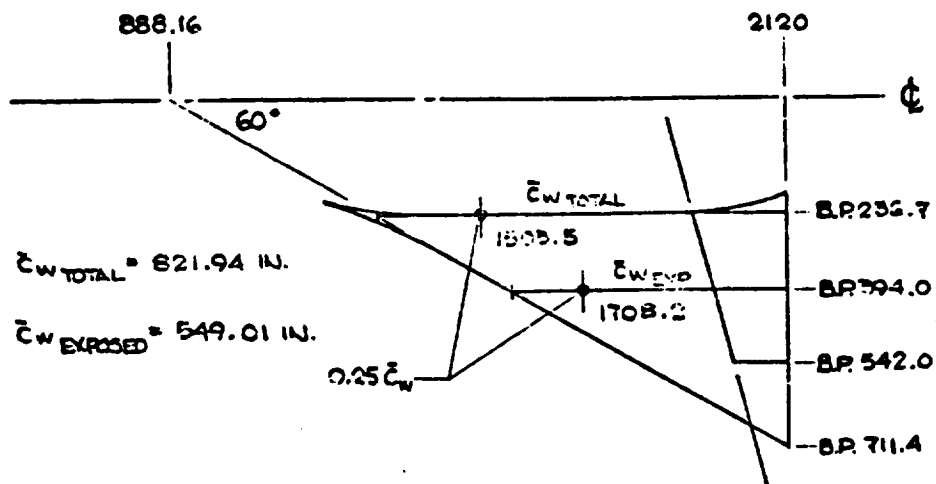


FIGURE 9 TWISTED DELTA WING (W14)

DELTA WING ORBITER
NR
DR#1027 8-1- 508

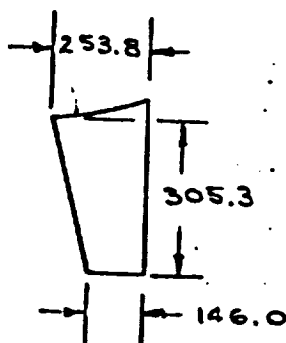


FIGURE 10

ELEVON, E₂ - Elevon Used With Wing-W₁₃

OFFICIAL USE ONLY

DELTA WING ORBITER
NR
DR#1027 B-1- 509

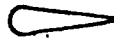
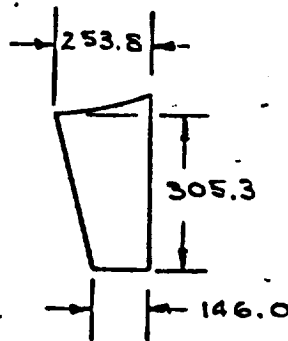
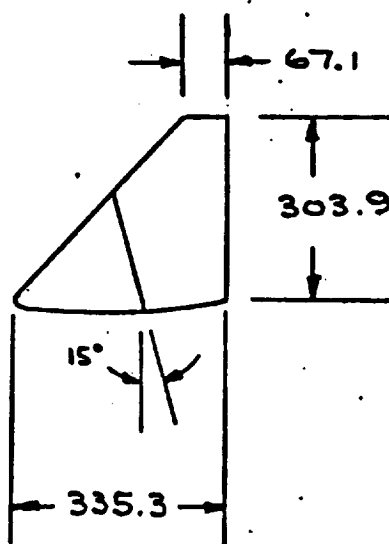


FIGURE 11

ELEVON, E_3 - Elevon Used With Wing - W_{14}



0012-64 SERIES AIRFOIL

FIGURE 12
VERTICAL STABILIZER V_{14} 9992-134B CONFIGURATION

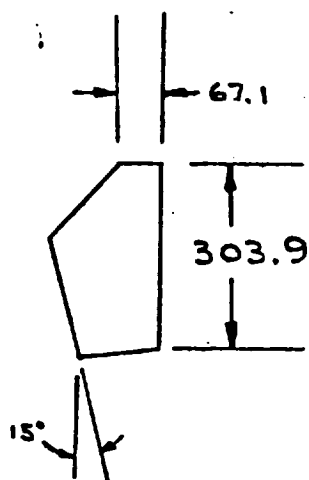


FIGURE 13
RUDDER - R₄

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1027 B-1- 512

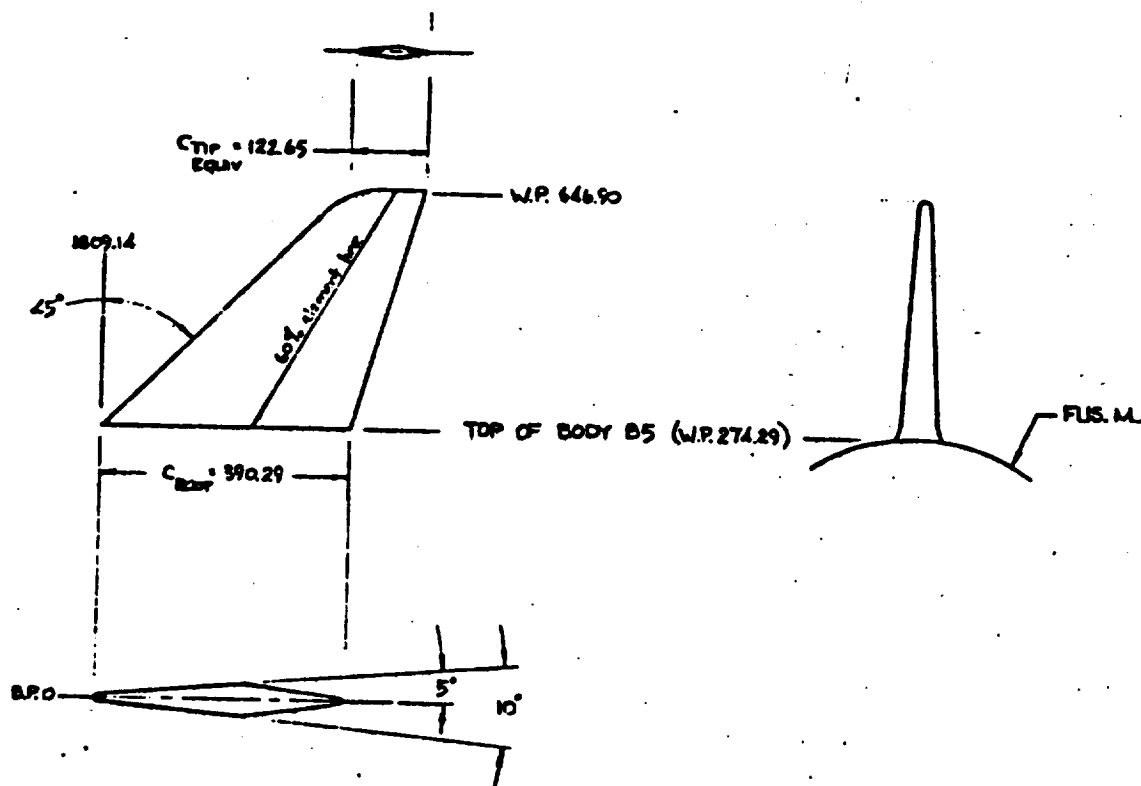


FIGURE 14
VERTICAL STABILIZER VI6

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1027 B-1- 513

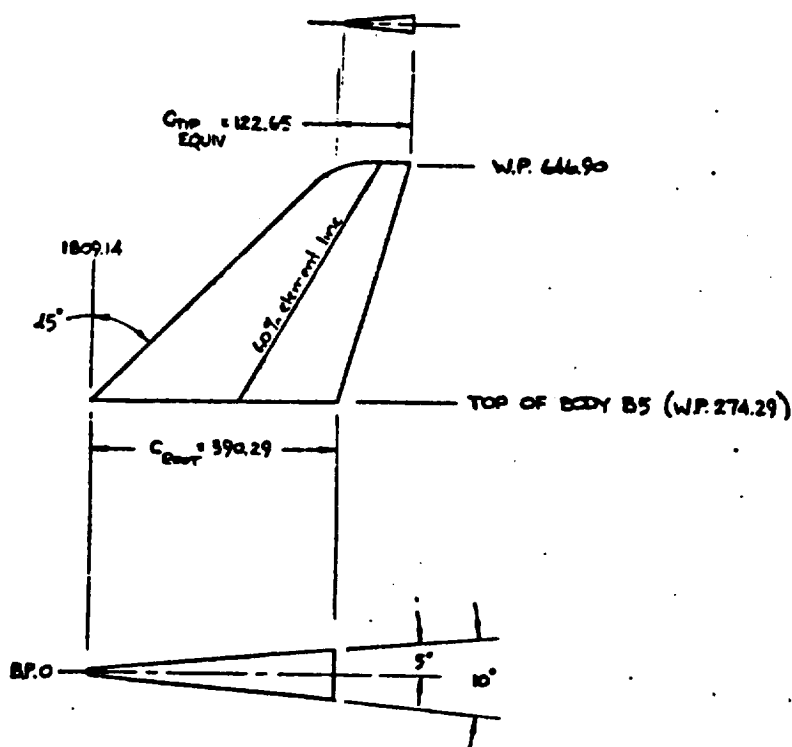


FIGURE 15
VERTICAL STABILIZER V17

DELTA WING ORBITER
NR
DR#1027 B-1- 514

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

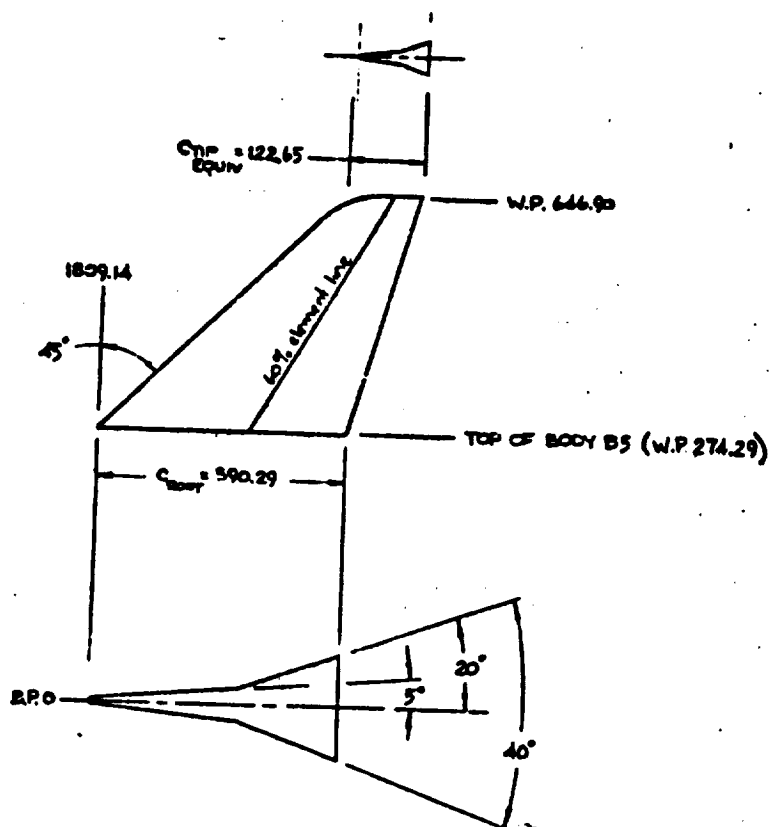


FIGURE 16
VERTICAL STABILIZER V18

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1027 B-1- 515

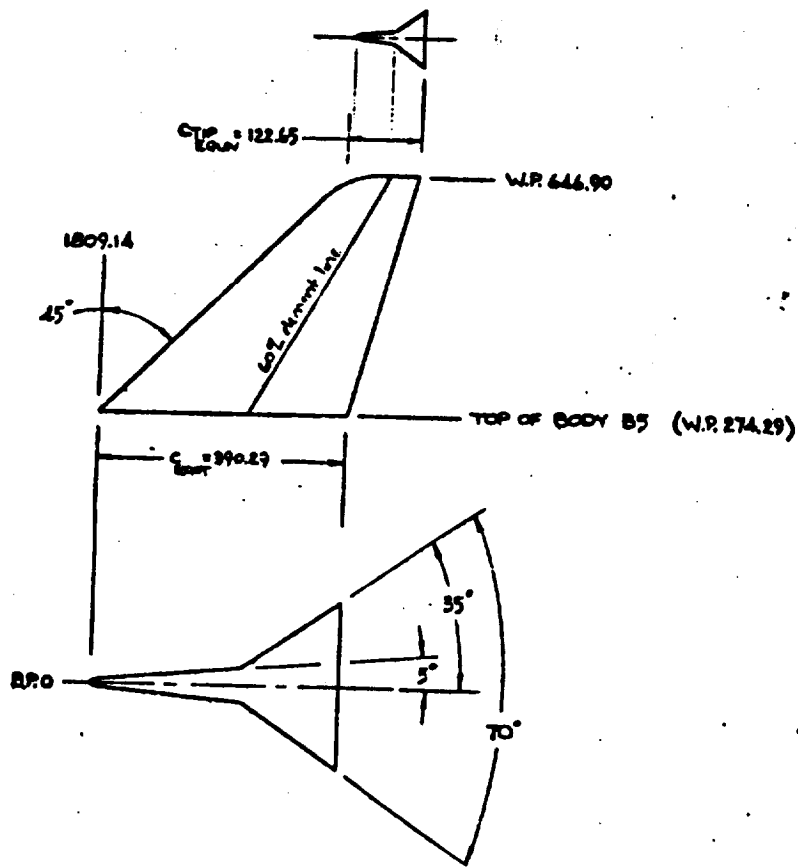


FIGURE 17
VERTICAL STABILIZER VI9

BRKT(STING BEND 2)COLLATED

DATA SET COLLATION SHEET - POST TEST

TEST **88**

REYNOLDS NO. = 2.3×10^6 PER FT

MACH NO. = 7.4

0 PITCH
RA4 1 SIDESUP
↓ CONFIG

DATA SET IDENTIFIER	CONFIGURATION	RUN MODE	SCHD. B	CONTROL DEFLECTION	NO. OF RUNS	BRKT 0° STING BEND	BRKT 15° STING BEND	BRKT 30° STING BEND	BRKT 45° STING BEND	BRKT 60° STING BEND
				δ _δ	δ _γ	δ _γ	δ _γ	δ _γ	δ _γ	δ _γ
RA4-001	B	PTCH	0	OFF	OFF	—	4	5 A	4 B	34 E
002	BW			0	OFF	—	4	2 A	3 B	37
003	BW3			0	OFF	—	4	18 C	19 D	50
004	BWVE0 R0			0	0	20 6	4	6 A	7 B	38
005	BWVE-15 R0			-15	0	20 6	4	9 A	8 B	41
006	BWVE-30 R0			-30	0	20 6	4	10 A	11 B	42
007	BWVE-45 R0			-45	0	20 6	4	13 A	12 B	45
008	BWVE 15 R0			15	0	20 6	4	14 A	15 B	46
009	BWV6 R0			0	0	20 6	4	17 C	16 B	49
010	BWV2 R0	↑	↑	0	0	45 6		21 C	20 D	53
RA4 112	BWVR-10	SIDESUP	G	0	-10	20 6		77 α=0°	78 α=15°	74 α=30°
101	B			OFF	OFF	—		22	23	75 α=45°
102	BW			0	OFF	—		25	24	72
104	BWVE0 R0			0	0	20 6		26	27	60
113	BWVRF10			0	10	20 6			28	67
114	BWVRF20			0	20	20 6			29	66
109	BWV6 R0			0	0	20 6		33	32	68
111	BWV3 R0			0	0	20 10			31	59
110	BWV2 R0	↑	↑	0	0	45 6			30	54
										55
										56
										57
										58
										59
										60
										61
										62
										63
										64
										65
										66
										67
										68
										69
										70
										71
										72
										73
										74
										75
										76
										77
										78
										79
										80
										81
										82
										83
										84
										85
										86
										87
										88
										89
										90
										91
										92
										93
										94
										95
										96
										97
										98
										99
										100

CN	CA	CLM	CY	CYN	CBL	CAB	MACH	ALFA	7
COEFFICIENTS: A=0.2, 4, 8, 12 C=0 2 4 6 8 10 12 14									75.76
B=15, 17, 23, 27 D=15 17 19 21 23 25 27 29									75.76
E=30 32 34 36 38 40 42 44									75.76
F=45 47 49 51 53 55 57 59 61									75.76
SCHEDULES									75.76
G=β SCHED = 0, 2, 4, 6, 8, 10, 12, 14, 16									75.76
IDPVAR (1) IDPVAR (2) INDV									75.76

THIS DRAWING IS
OF POOR QUALITY

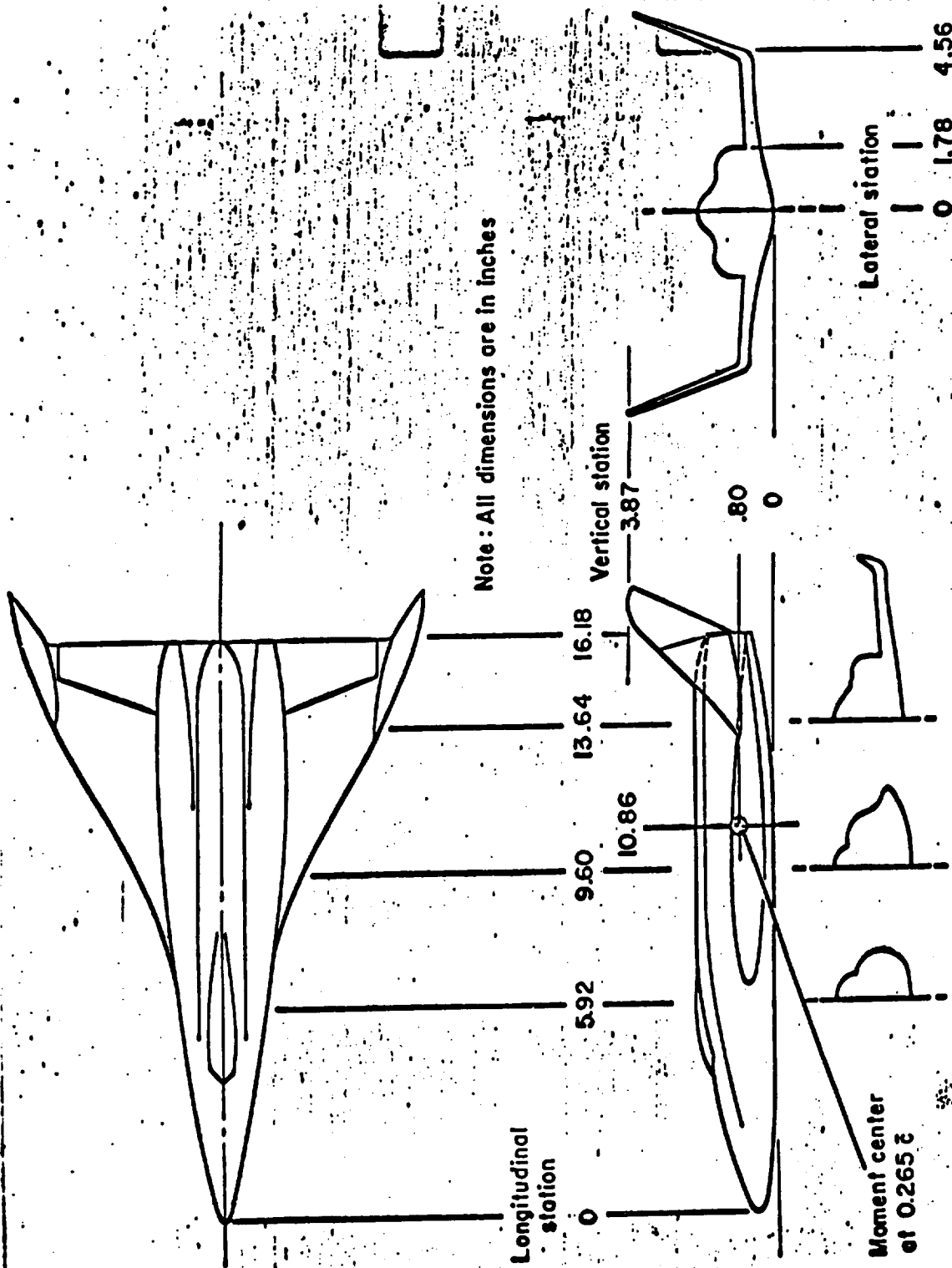


FIGURE 4. THREE VIEW DRAWING OF THE 0.008-SCALE MODEL
OF THE NORTH AMERICAN ROCKWELL SSV-129 ORBITER

DELTA WING ORBITER
NR
DR#1031 B-1- 517

NOTE: ALL DIMENSIONS IN INCHES

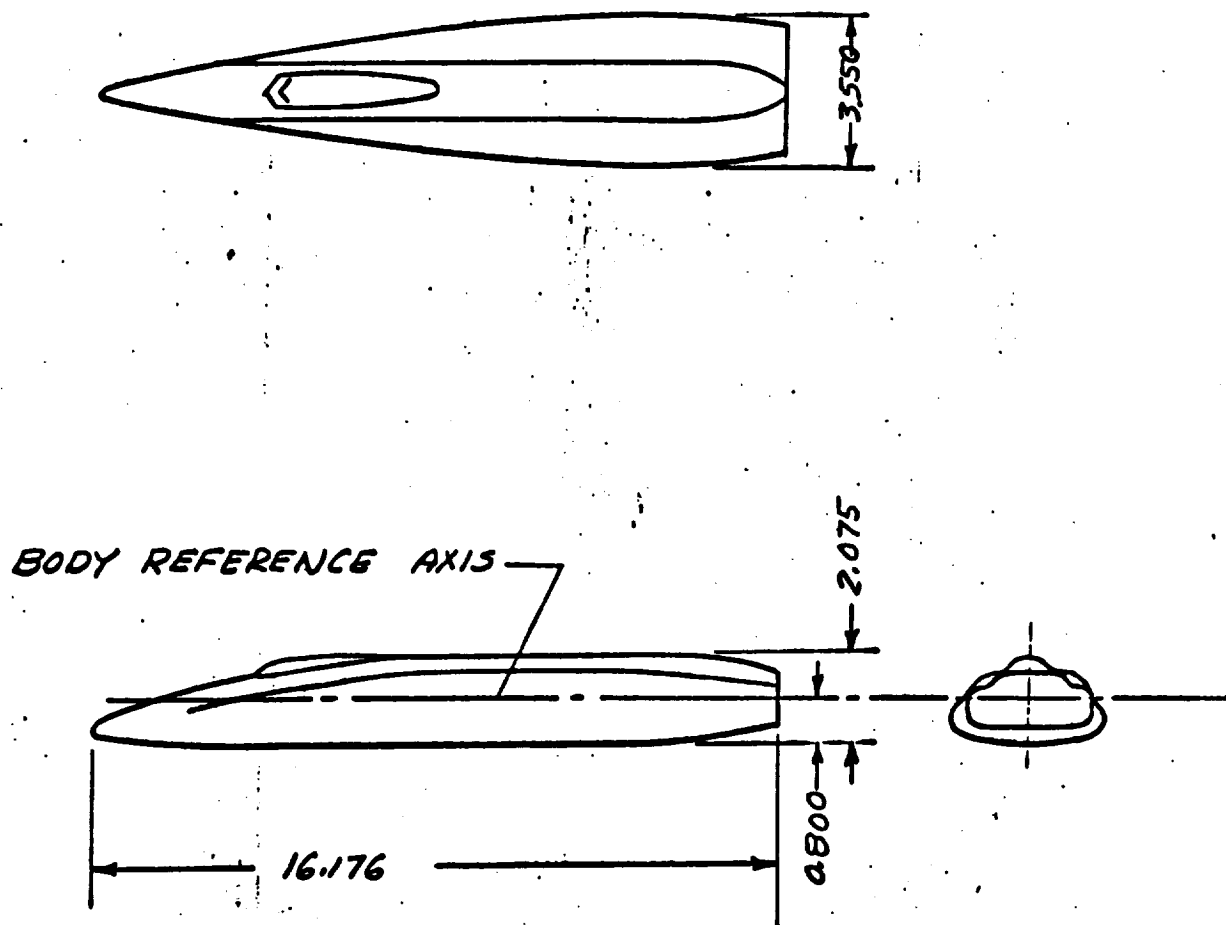
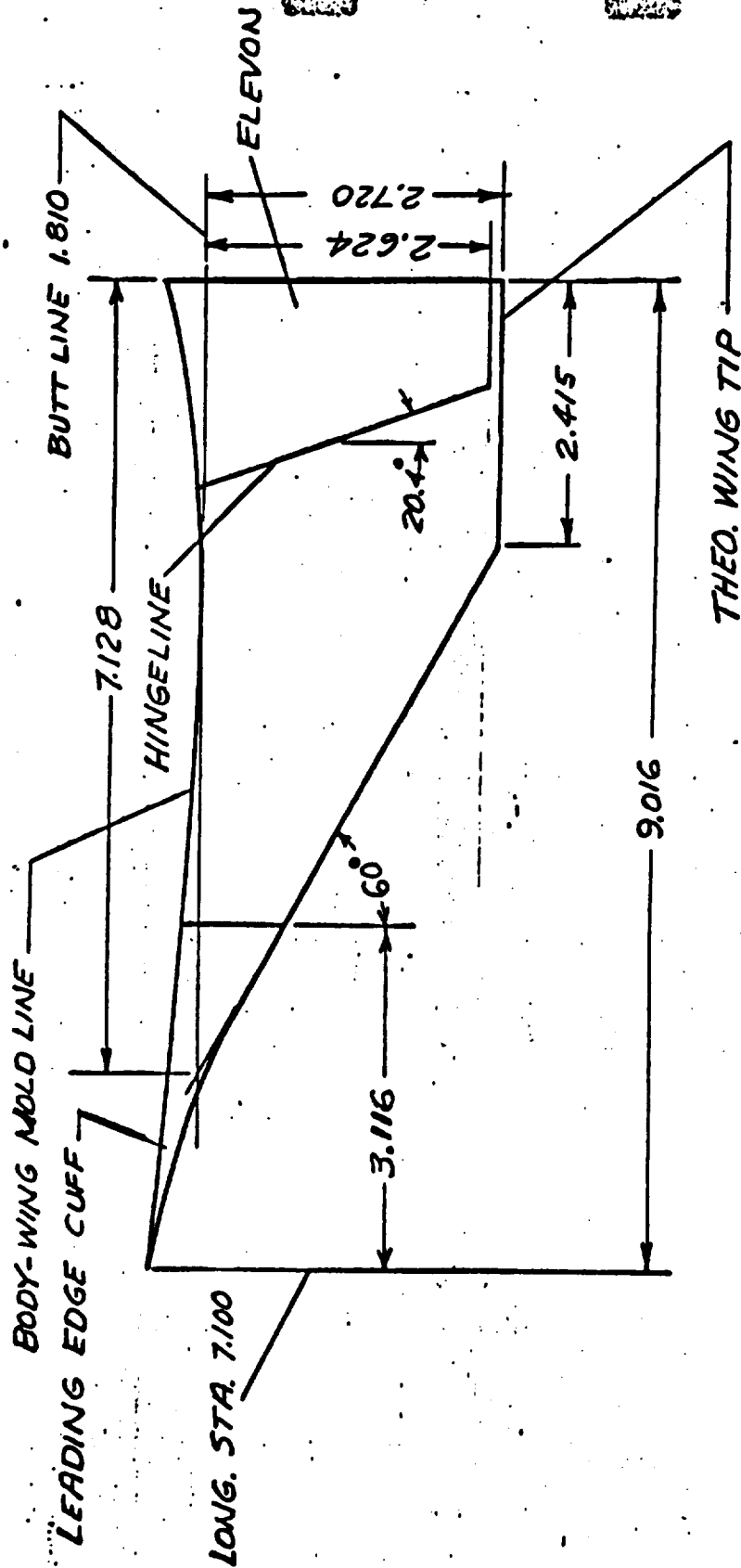


FIGURE 5. BODY B
DRAWING NUMBER NAR 9992-129

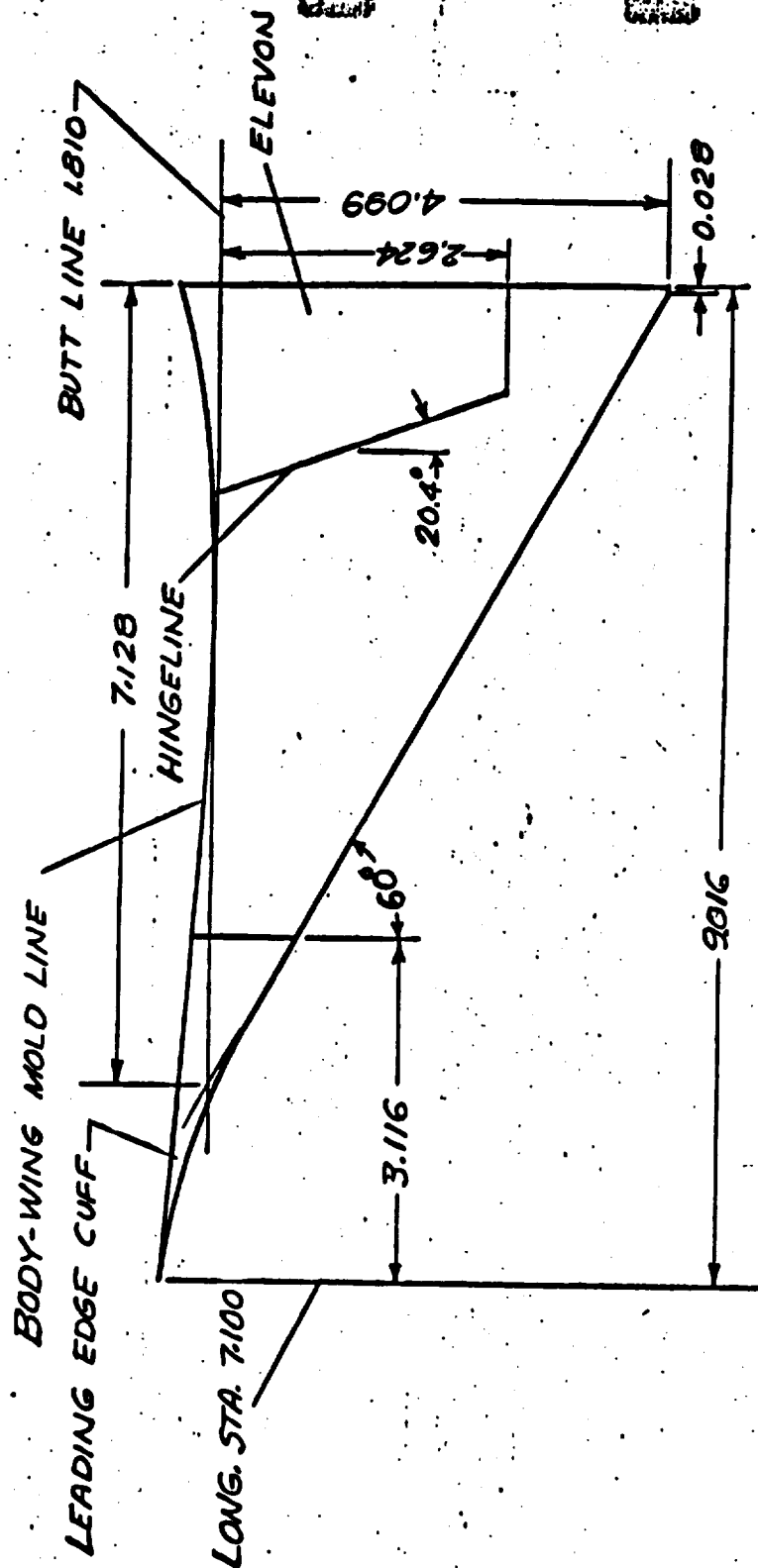
ORIGINAL PAGE IS
OF POOR QUALITY



NOTE: ALL DIMENSIONS IN INCHES

FIGURE 6. WING W WITHOUT VERTICAL TAIL
DRAWING NUMBER NAR 9992-129

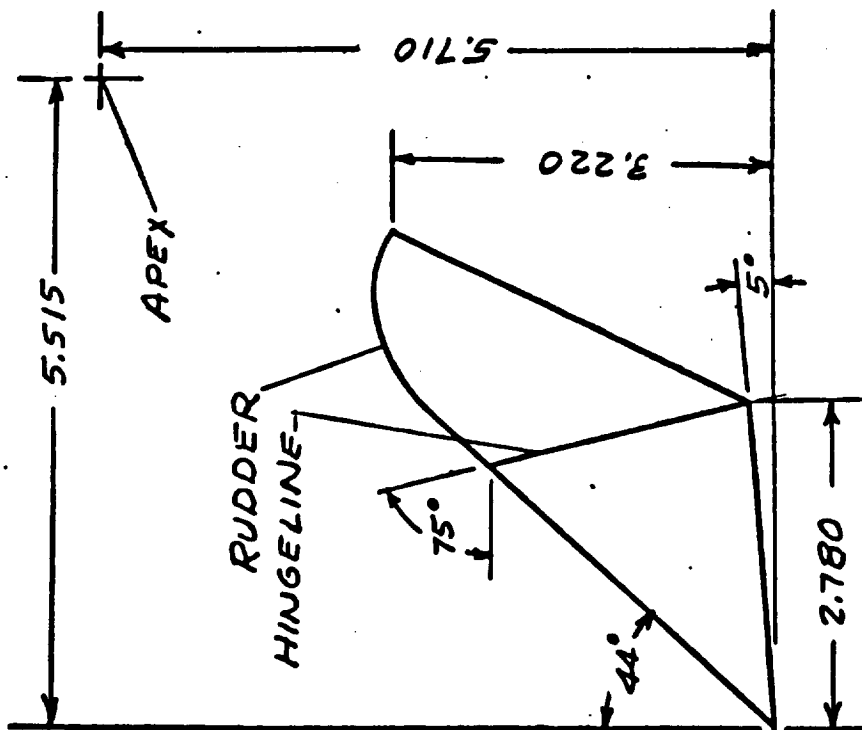
DELTA WING ORBITER
NR
DR#1031 B-1- 519



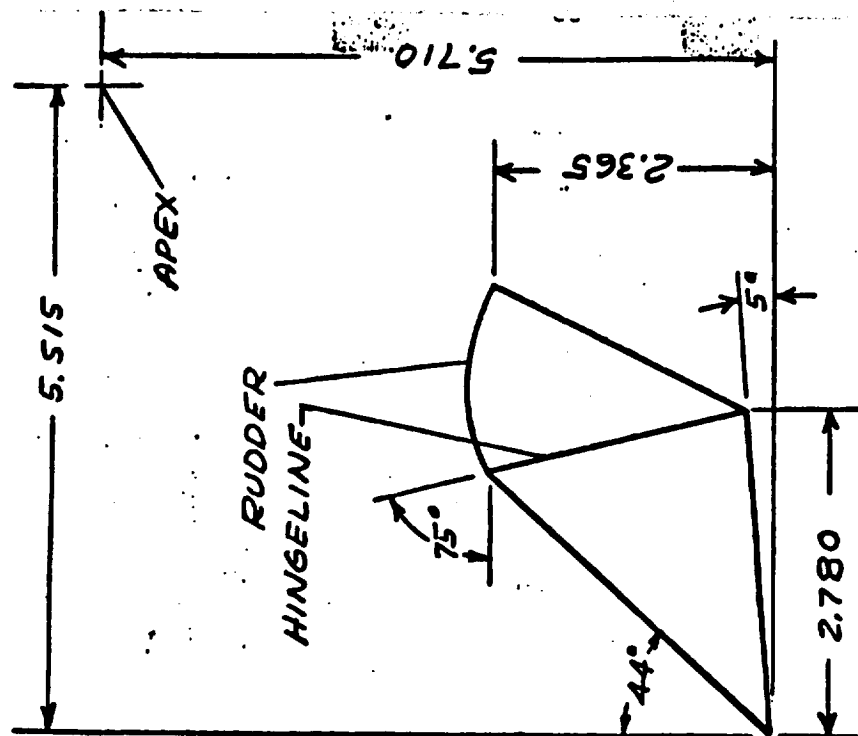
NOTE: ALL DIMENSIONS IN INCHES

FIGURE 1. WING W3
DRAWING NUMBER NAR 9992-129

NOTE: ALL DIMENSIONS IN INCHES



TAIL V₁, V₂, AND V₃



TAIL V₆

FIGURE 8. VERTICAL TAILS
DRAWING NUMBER 9992-129

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER
NR
DR#1031 8-1- 621

PRETEST	POSTTEST
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

[illegible]

COEFFICIENTS:

ICL	ICDF	ICLM	ICN	ICAF	ICLN	ICSL	ICY	ICPN/L/L/D	ILLO
-----	------	------	-----	------	------	------	-----	------------	------

$$\begin{aligned}\alpha(A) &= -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 25, 30, 35, 40, 45 \\ \alpha(B) &= -4, -2, 0, 2, 4, 6, 8, 10, 12, 13, 14, 15, 16, 17, 18, 20, 25, 30, 35, 40 \\ \beta(4) &= +8, +6, +4, +3, +2, +1, 0, -1, -2, -3, -4 \quad \beta(H) = -8, -4, 0, 4, 8 \\ \beta(F) &= +8, +6, +4, +2, 0, -2, -4\end{aligned}$$

2 OF 8
SCHEDULES

ADN

TEST NAAAL 630 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		α	β	δ	ϵ		21	27	33	39	45	51	57	63	69	75
RCS 247	B4 W10 V12	A	5°				47									
148	✓	A	0°				48									
248	✓	A	0°				✓									
149	✓	A	5°				49									
249	✓	A	5°				✓									
150	✓	A	0°				50									
250	✓	A	0°				✓									
151	✓	A	5°				51									
251	✓	A	5°				✓									
152	B4 W8 V10	B	3°				52									
153	✓	B	6°				53									
154	✓	12°	G				54									
155	✓	21°	G				55									
156	✓	30°	G				56									
157	✓	0°	G				57									
158	B4 W8 V10 R3	A	3°	-10°			58									
159	✓	B	6°	-10°			59									
160	✓	A	3°	-20°			60									
161	✓	B	6°	-20°			61									
Y 162	B4 W8	0°	G	—			62									

7	13	19	25	31	37	43	49	55	61	67	75	76
COEFFICIENTS:												
IDPVAR(1) IDPVAR(2) NDV												

DELTA WING ORBITER
NR
DR#1037 B-1- 523

TEST NAAL630 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		a	B	Sr	Sr		21	22	23	24	25	26	27	28	29	30
163	B4W8	12°G					21									
164	✓	21°G					22									
165	✓	30°G					23									
166	B4W9	0°G					24									
167	✓	12°G					25									
168	✓	21°G					26									
169	✓	30°G					27									
170	B4W8V10R3	A 0°		-20°			28									
270	✓	A 0°		-20°			29									
171	✓	B 0°		-10°			30									
271	✓	B 0°		-10°			31									
172	B4W8V10	A 0°		-			32									
272	✓	B 0°					33									
173	B4W10V12	A 0°					34									
273	✓	A 0°					35									
182	B4	C 0°					36									
282	✓	C 0°					37									
Y 382	✓	C 0°					38									

1	7	13	19	25	31	37	43	49	55	61	67	73	76
COEFFICIENTS:													
a or B	2(C) -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 20, 25, 30, 35, 40, 45,												IDPVAR(1) IDPVAR(2) NDV
SCHEDULES	50, 55, 60												

DELTA WING ORBITER

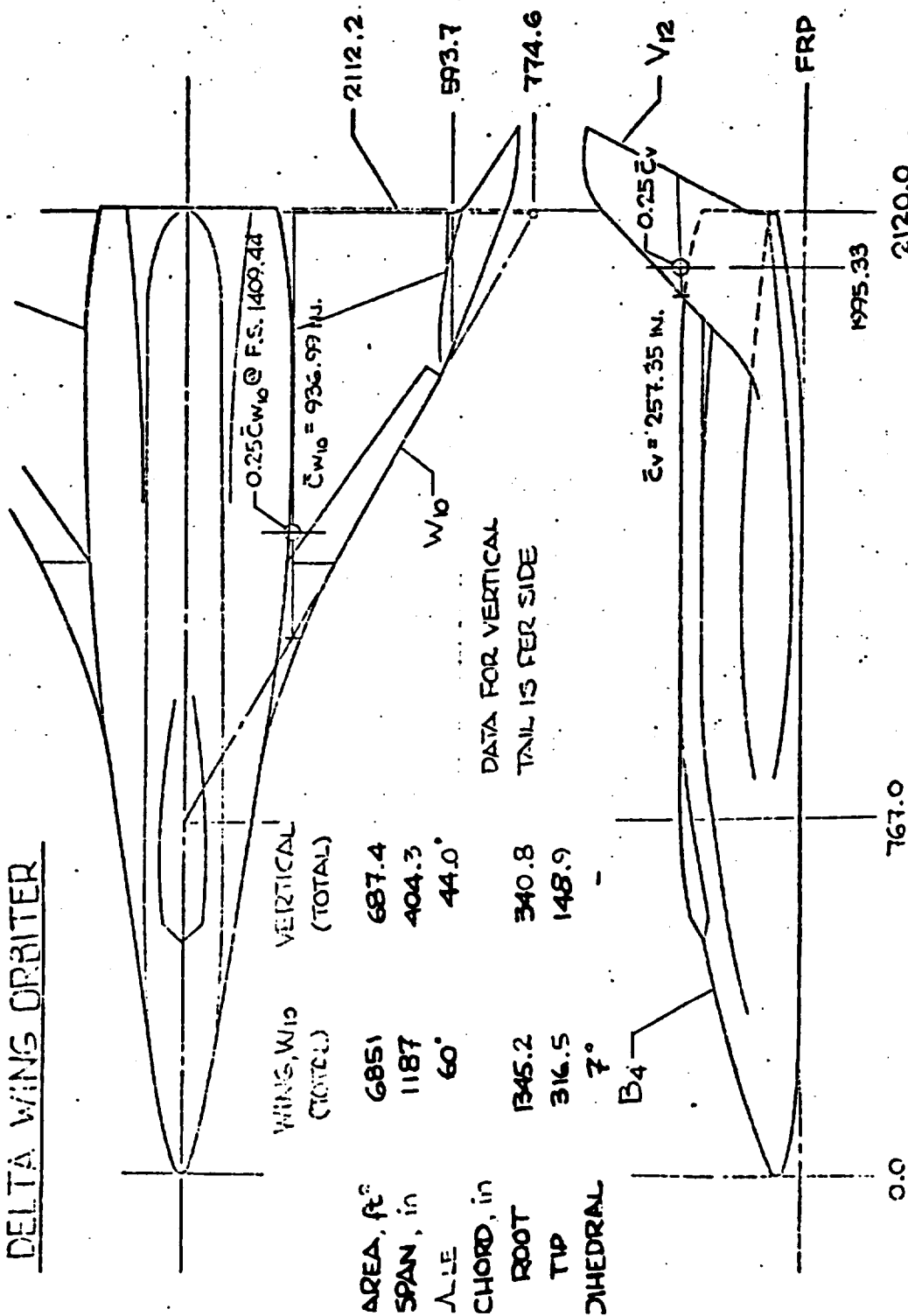


FIGURE 2. DRAWING OF DELTA WING ORBITER (B4W10V12)

DELTA WING ORBITER

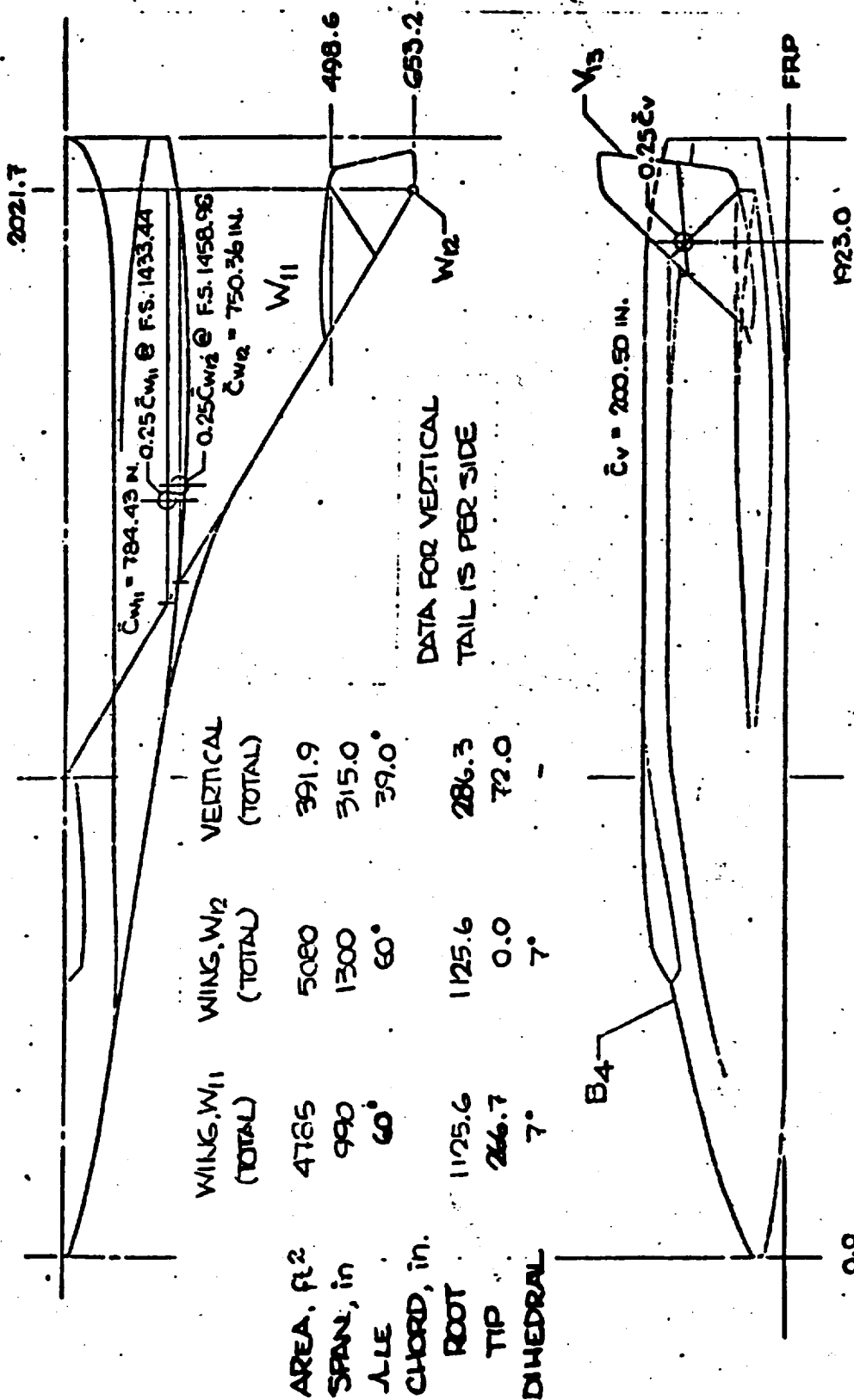
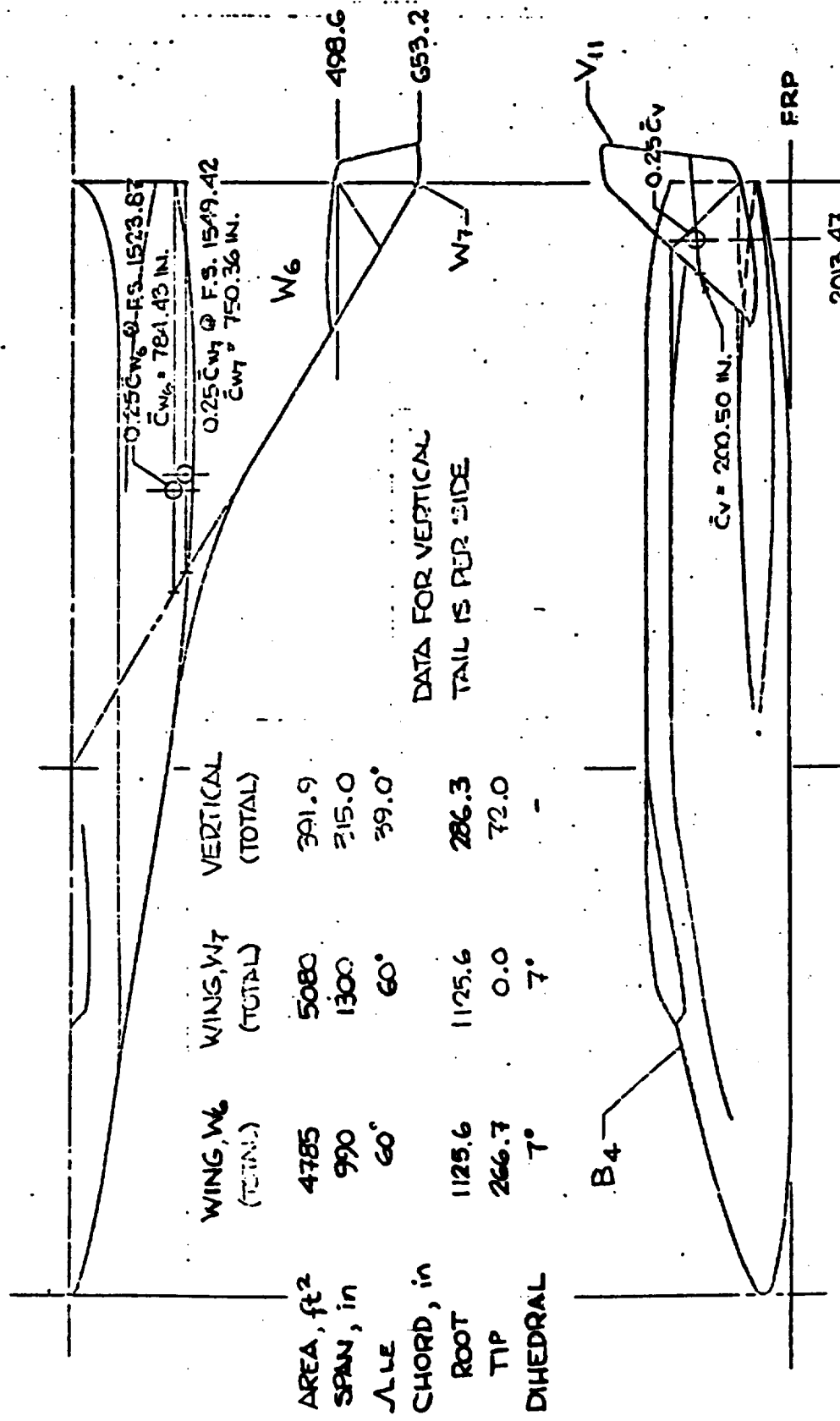


FIGURE 3. DRAWING OF DELTA WING ORBITER (B4W1V13; B4W12)

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER



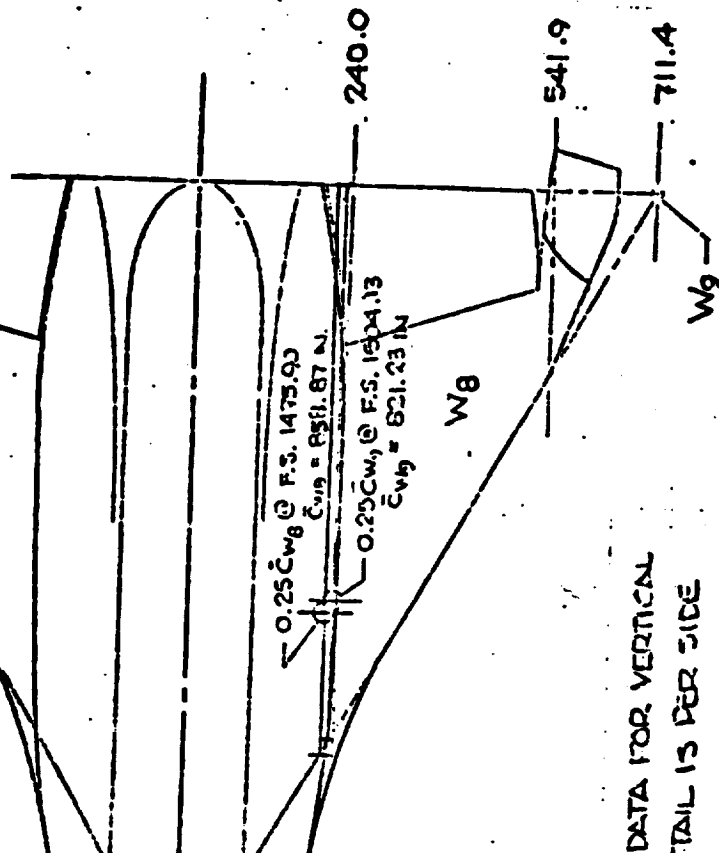
AREA, ft ²	WING, W ₆ (TOTAL)	WING, W ₇ (TOTAL)	VERTICAL (TOTAL)
4785	5080	391.9	
990	1300	215.0	
60°	60°	39.0°	
CHORD, in	WING, W ₆ (TOTAL)	WING, W ₇ (TOTAL)	VERTICAL (TOTAL)
1125.6	1125.6	286.3	
266.7	0.0	72.0	
7°	7°	-	

0.0 995.33 2013.47 2120.0

FIGURE 4. DRAWING OF DELTA WING ORBITER (B4W6V11 & B4W7)

DELTA WING ORBITER
NR
DR#1037 B-1- 527

DELTA WING ORBITER



DATA FOR VERTICAL
TAIL IS PER SIDE

AREA, ft^2	WING, W_8 (TOTAL)	WING, W_9 (TOTAL)	VERTICAL (TOTAL)
SPAN, in	5740	6084	424.5
MEAN CHORD, in	1084	1422	302.2
ROOT	60°	60°	38.8°
TIP	1231.8	1231.8	335.1
DIHEDRAL	293.4	0.0	68.4
	7°	7°	-

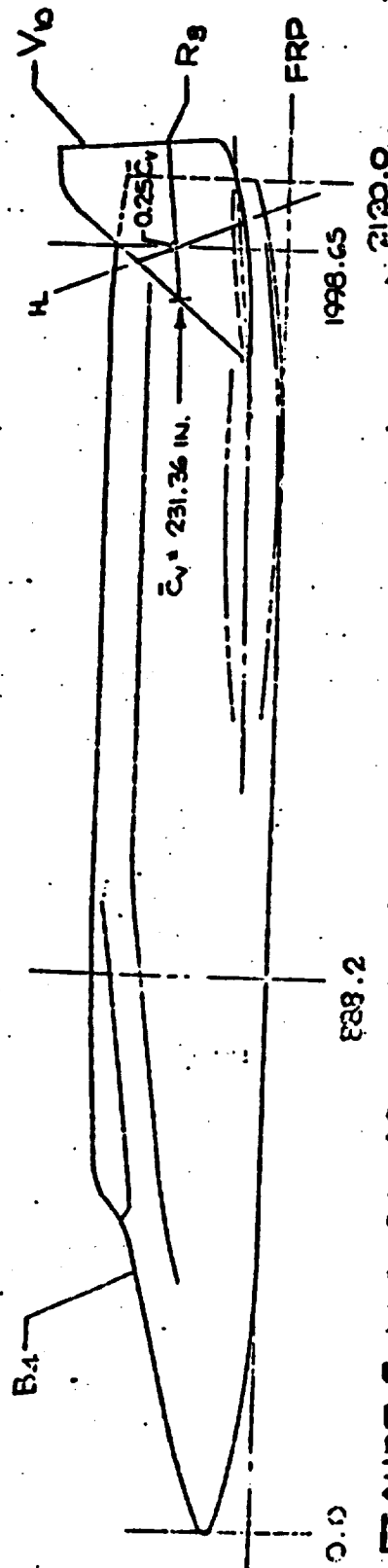


FIGURE 5. DRAWING OF DELTA WING ORBITER (B4W8V10 & B4W9)

1

TEST TWT-471 DATA SET COLLATION SHEET

Force-Straight Wing Orbiter, 0.0025-Scale, Stability Control

☐ PRETEST
☒ POSTTEST

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES		NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		A	B	SA	SAIT		0.6	0.9	0.95	1.0	1.05	1.1	1.2	1.46
R1301B	B6X	B	0			1								
02B	B6W10X	↑	↑			1				057/6				
02A	B6W10H12X	A	↑	0		2	018/6			054/6				
04A		↑	↑		120	2	002/6			017/6				
03B		B	↑	↑		1				001/6				
05B		↑	↑	10		2		054/6		055/6				
06B		↑	↑	-30		1				034/6				
07B		↑	↑	↑ 120		1				049/6				
08A	B6W10H12V5X	A	↑	0		5	012/6	013/6	014/6	015/6			016/6	
09A	B6W10H12V5	↑	↑	↑		4		095/6		094/6	093/6	092/6		
01D	B6X	15 D	↑			1				082/6				
10D	B6	↑	↑			1					083/6			
02D	B6W10X	↑	↑			1				081/6				
11D	B6W10	↑	↑			1					084/6			
03D	B6W10H12X	↑	↑	0		3	078/6	079/6		080/6				
12D	B6W10H12	↑	↑	↑		1					085/6			
08D	B6W10H12V5X	↑	↑	↑		8	077/6	076/6	075/6	074/6	073/6	072/6	071/6	070/6
08E	↑	60	↑	↑		1							063/6	
09D	B6W10H12V5	15	↑	↑		2		087/6				086/6		

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CLM	15L	KLN	KY	15L	KAE	KDE	IL/D	KCP					9

COEFFICIENTS: $\alpha A = 0.2, 4, 6, 10, 12, 14, 16, 18, 20$
 $\alpha B = 20, 22, 24, 26, 28, 30, 32, 34, 36, 40$
SCHEDULES: $\alpha D = -4, -2, 0, 2, 4, 6, 8, 10$

SH + T.E. Down

DELTA WING ORBITER
NR
DR#1043 B-1- 529

DELTA WING ORBITER
NR
DR#1043 B-1- 530

TEST TWT-471 DATA SET COLLATION SHEET

Force - De Ha Wing Center, 0.0025-5000, Stal 14, 3 Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCID.		PARAMETERS/VALUES		NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		a	b	SE	UNIT		0.6	0.9	0.95	1.0	1.05	1.1	1.2	1.26
22313A	B5W14E3V17X	A	0	0		4	025/0	024/0	022/0	022/0				1.964.76
13B		B	1	↑		10	034/0	037/0	029/0	049/0	041/0	042/0	039/0	041/0
14A		A	1	-15		3	057/0	008/0		009/0				
15A		↑		120		2	066/0			003/0				
15B		B	1	↑		2	043/0			044/0				
16B		↑		90		1								052/0
14B		↑		↑		7	047/0	041/0		045/0			008/0	005/0
17A		A	1	-15	15R	3	019/0	020/0		021/0				
17B		B	1	↑		7	032/0	032/0		034/0		035/0	027/0	006/0
13A	B5W14E3V17	A	0	0		4				094/0	097/0	095/0		101/0
19A		↑		-15		2					099/0			102/0
20A		↑		-15	15R	1					100/0			
21D	B5K	0	D			1				019/0				
22B	B5	↑				1					091/0			
23D	B5W14E2K	↑		0		1				028/0				
24D	B5W14E2	↑				1					090/0			
13D	B5W14E2V17X	↑				3		031/0	024/0	027/0				
18D	B5W14E2V17	↑				2					028/0	091/0		
25F	B5W14E2V18X	45	↑			1								002/0

1	7	13	19	25	31	37	43	49	55	61	67	73	79
KLM	KLN	KV	KY	KZ	L	L	L	L	L	L	L	L	L
COEFFICIENTS: $\alpha_A = 0.2, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0$													
$\alpha_P = 2.0, 2.2, 2.4, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0$													
$\alpha_D = -4, -2, 0, 2, 4, 6, 8, 10$													
SCHEDULES													
a or b													
IDPVAR(1) IDPVAR(2) ND													

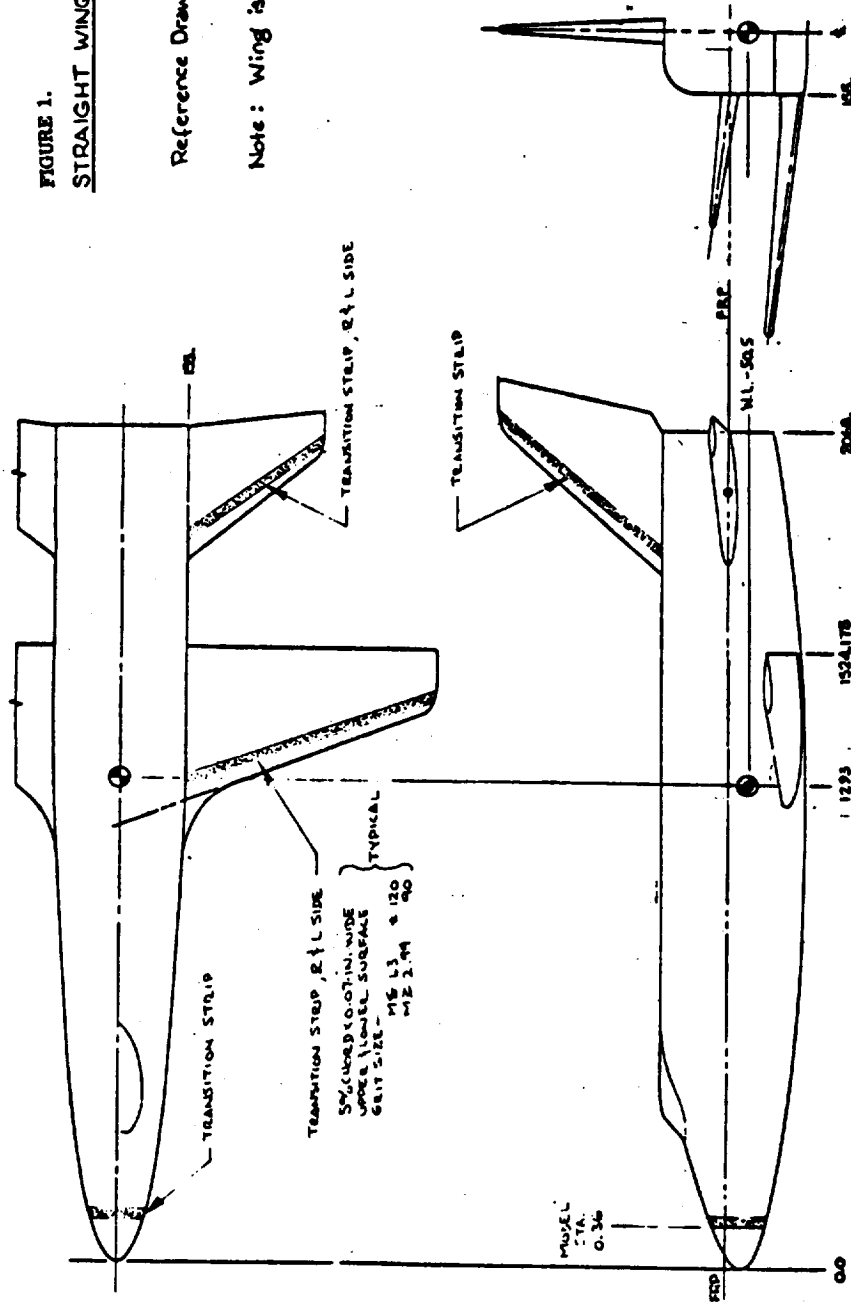
Set = 7. E. D. W.

FIGURE 1.
STRAIGHT WING SSV ORBITER

Reference Drawing 9992-130C

Note: Wing is in -130G position

ORIGINAL PAGE IS
OF POOR QUALITY



DELTA WING ORBITER
 NR
 DR#1043 B-1- 532

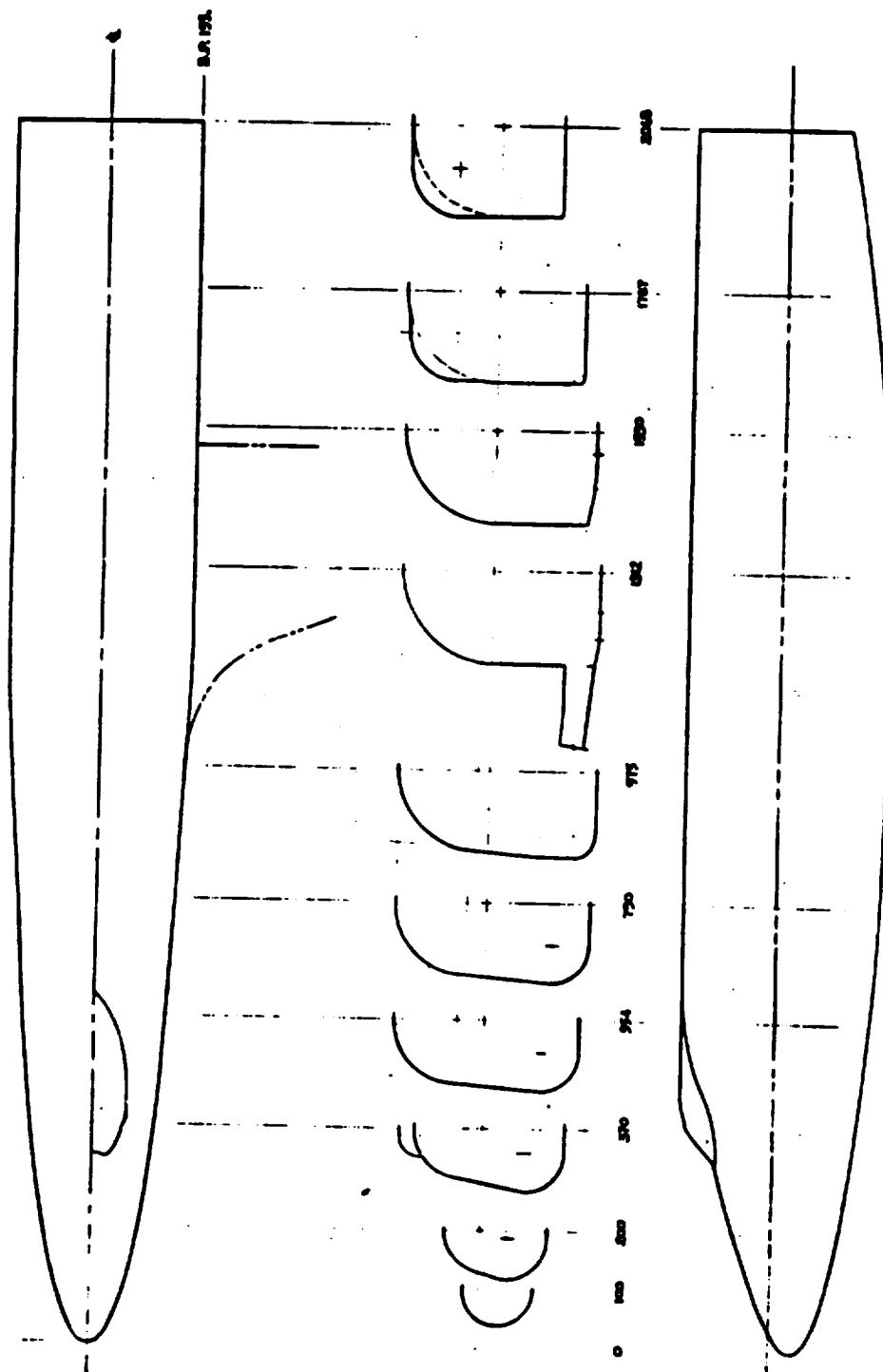


FIGURE 2 BODY B6 9992-130 C CONFIGURATION

ORIGINAL PAGE IS
OF POOR QUALITY

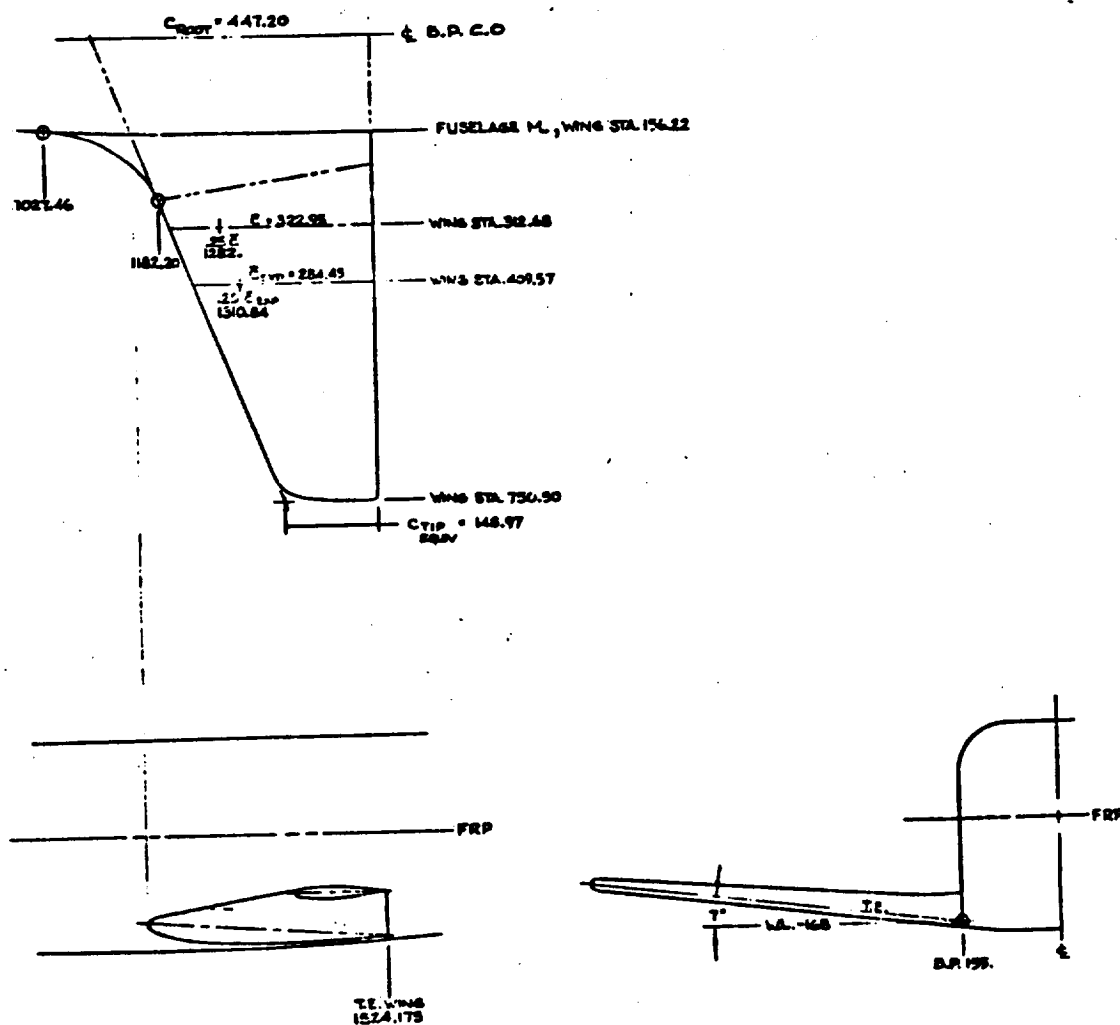


FIGURE 3

WING WIO

9992-130 C CONFIGURATION
9992-130 G WING POSITION

DELTA WING ORBITER
NR
DR#1043 B-1- 534

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

ORIGINAL PAGE IS
OF POOR QUALITY

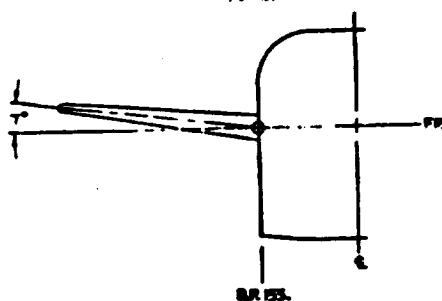
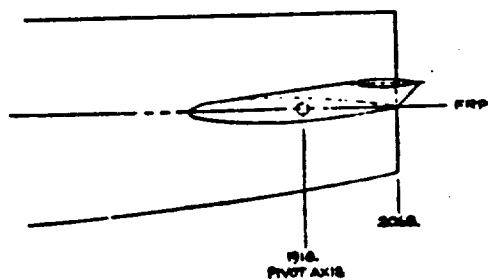
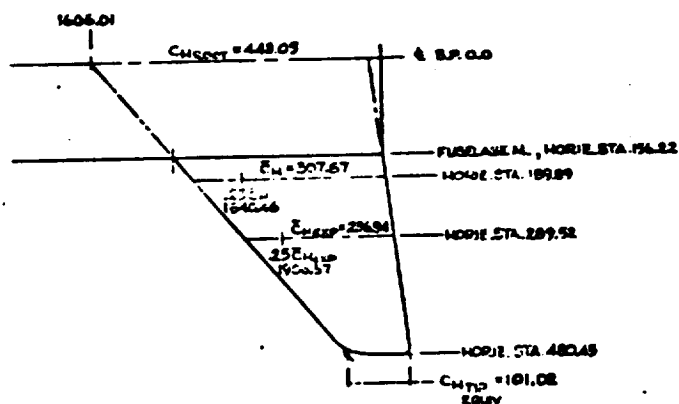


FIGURE 4
HORIZONTAL STABILIZER H12 9952-130C CONFIGURATION

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER
NR
DR#1043 B-1- 535

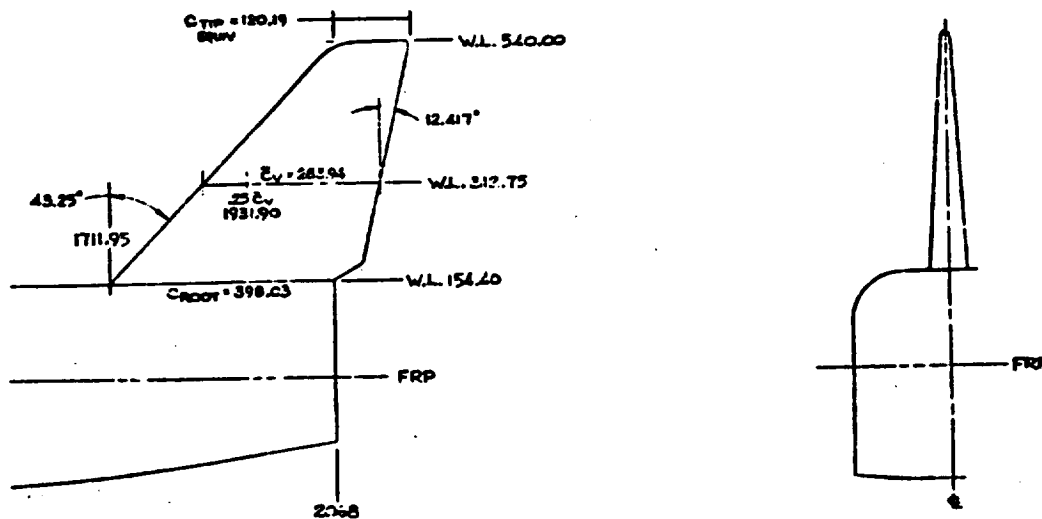


FIGURE 5

VERTICAL STABILIZER V5

9992-130 C CONFIGURATION

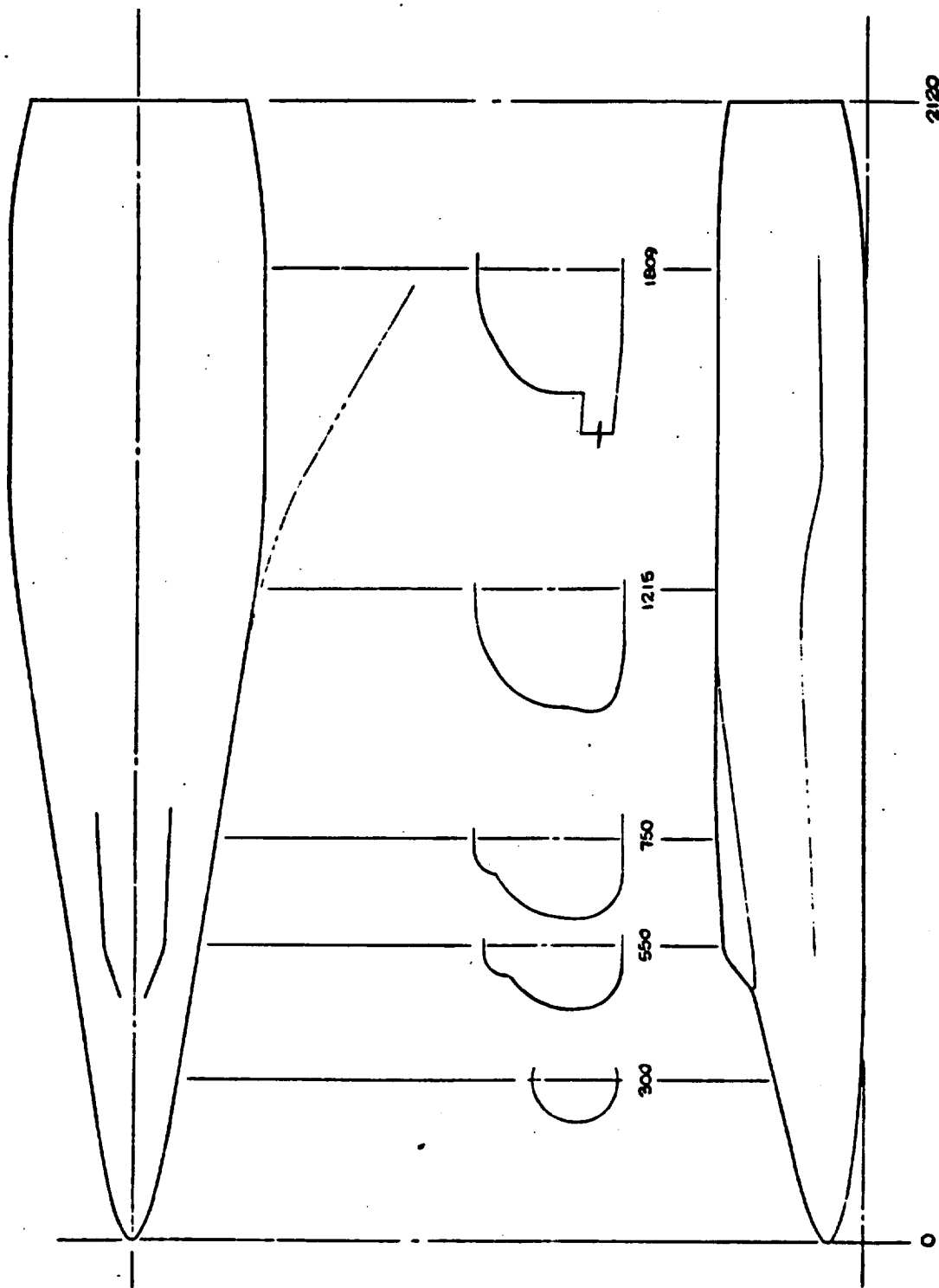


FIGURE 7 BODY B5 9992-134B CONFIGURATION

DELTA WING ORBITER
NR
DR#1043 B-1- 537



0.25 \bar{E}_y



TRP CHORD (B.P. 542.0)

CC12-64 SERIES AIRFCIL

WINE W14

640

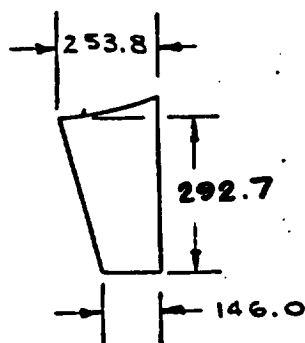


FIGURE 9
ELEVON, E₂ - Elevon Used with Wing W₁₃
E₃ - Elevon Used with Wing W₁₄

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

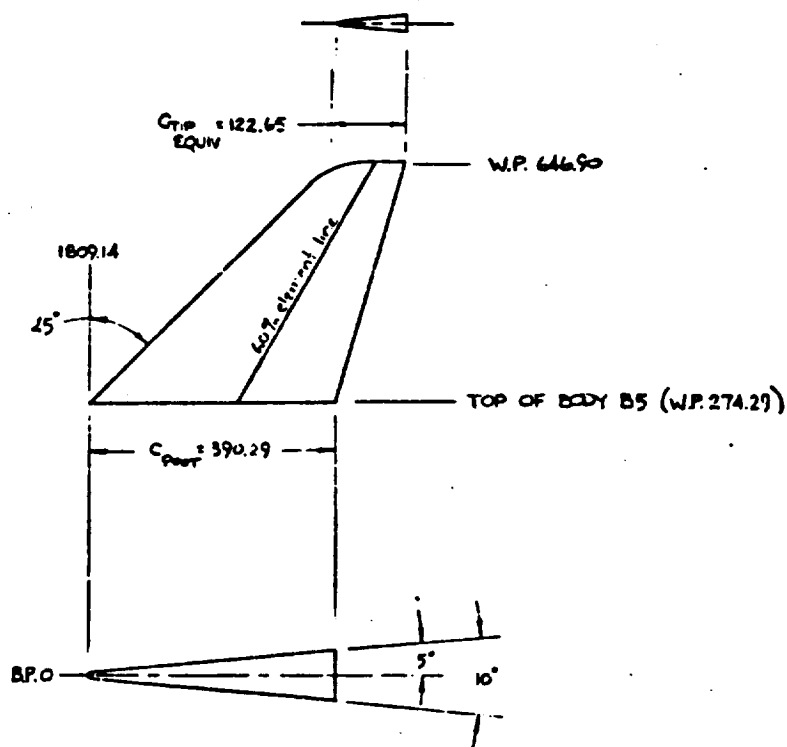


FIGURE 10
VERTICAL STABILIZER V17

ORIGINAL PAGE IS
OF POOR QUALITY

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1043 B-1-541

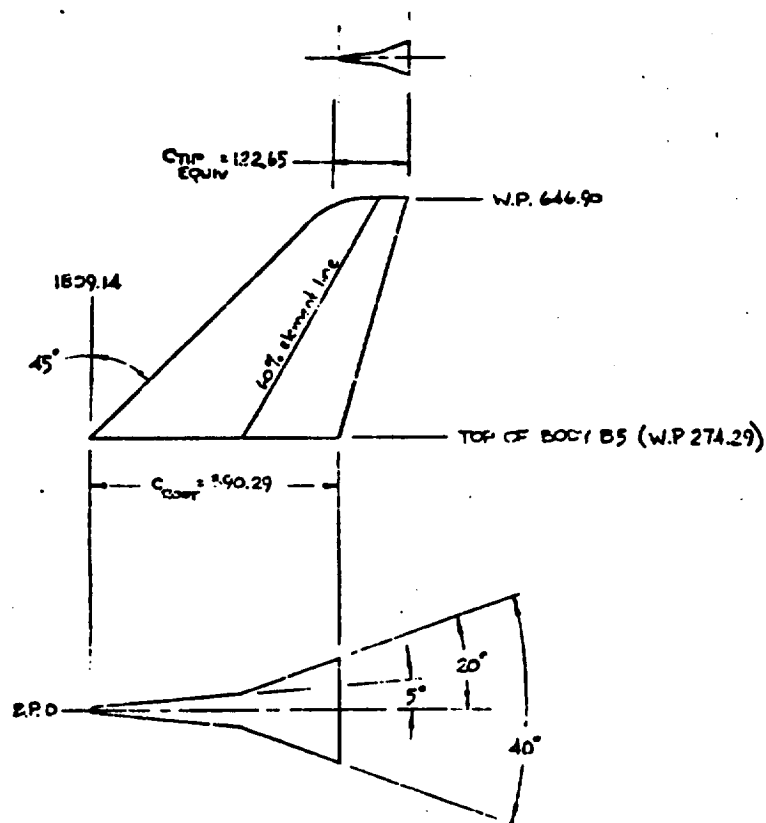


FIGURE 11
VERTICAL STABILIZER V18

TEST TW-478 DATA SET COLLATION SHEET

Force - Straight Wing Orbiter, 0.0035-scale Stability & Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.			PARAMETERS/VALUES			NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)			
		a	B	C	SH	SE	SA		2.99	4.96		
R2701C	B6	C	O					1		038/0		
	O2C B6W10									037/0		
	O2C B6H12				O					019/0		
	O4C				10					011/0		
	O5C				20					013/0		
	O6C				30					016/0		
	O7C				-10					017/0		
	O8C				-20					020/0		
	O9C				-30					031/0		
	10C				-40					034/0		
	11C				-50					035/0		
	12C B6W10H12				O			2	018/0	020/0		
	13C				10			1		021/0		
	14C				20			1		024/0		
	15C				30			1		025/0		
	16C				-10			1		028/0		
	17C				-20			2	047/0	029/0		
	18C				-30			1		032/0		
	19C				-40			2	050/0	033/0		
	20C				-50			1		034/0		

1	7	13	19	25	31	37	43	49	55	61	67	7576
CLM	KL	KL	KLN	EX	KSL	CAE	EDF	IL/D	KCP	IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS: $C_L = 40.41$, $C_D = 48.50$, $C_{L\dot{\alpha}} = 51.54$, $C_{D\dot{\alpha}} = 55.00$

a or B
SCHEDULES

$\Delta H (+), TE DOWN$
 $\Delta A = (\Delta H)_L - (\Delta H)_R$

Force-Straight Wing Orbiter, 0.0035-Scale Stability & Control

PRETEST

POSTEST

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		a	b	SA	SE	JA		299	496						
227	21C	86H16E14	C	0		0	0	1			018/6				
22C							10				017/6				
23C							20				016/6				
24C							30				015/6				
25C							-10				014/6				
26C							-20				013/6				
27C							-30				012/6				
28C							-40				011/6				
29C							-50				010/6				
30C	86W10H16E14						0				001/6				
31C							10				002/1				
32C							20				003/6				
33C							30				004/6				
34C							-10				005/6				
35C							-20				006/6				
36C							-30				007/6				
37C							-40				008/6				
38C							-50				009/6				
39C	86W10H17						0	2			001/6	039/6			
40C							-10	1			040/6				

75 76

КЛН	КЧ	КАВ	СДР	ИЛ/О	КСР
КИМ	КГ				

	TPDEVAR(1)	TPDEVAR(2)	NBY
COEFFICIENTS:			

WFF: 40 42 44 46 48 50 52 54 56 58 60
DELTA WING 0

SE (1), TE DOWNNR

DR#1076 B-

TEST TWT-478 DATA SET COLLATION SHEET

Force-Straight wing Orbiter, 0.0035-Scale Stability & Control

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIED	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		a	b	SH	SE	SA	SB		2.99	4.96								
22741C	B6W10H12	C	G	-20		20		2	0.53/0	0.41/0								
42C				-30		40		1		0.41/0								
43C				-40		20		2	0.53/0	0.43/0								
44C				-10		1		1		0.44/0								
45C				-20		40		1		0.45/0								
46C				-30		20		1		0.46/0								
47C				0		40		1		0.47/0								

1 7 13 19 25 31 37 43 49 55 61 67 75.76
 C.M. K.L. KLN KY KSL CAB CDE IL/D KCP
 COEFFICIENTS: $C_L = 40.42, 44.46, 48.50, 52.54, 56.58, 60$
 a or b
 SCHEDULES

TEST TW-478 DATA SET COLLATION SHEET

Force-Delta Wing Orbiter, 0.0035-Scale Stability & Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							
		A	B	SE	SA	SJ	SB		0.6	0.9	1.0	1.2	1.46	1.96	2.99	4.96
Q1754A	BSWITEJON17J2	A	0	0	0	0	0	1							227/0	
SSA				-10				1							218/0	
SCA	BSWITEJON17J2X			0				8	094/1106/1139/0140/0	001/0092/0091/0	091/0	096/0				
SCB		B						8	203/0204/0205/0	011/0117/0152/0	051/0	051/0				
SCC		C						8	220/0219/0218/0	012/0132/0154/0	053/0	054/0	053/0			
STA		A		-10				4					002/0055/1089/0	083/0		
STB		B						4					044/0114/0156/0	055/0		
STC		C						4					093/0175/0158/0	057/0		
S8A		A		-30				4					002/0056/0087/0	084/0		
S8B		B						4					095/0173/0160/0	059/0		
S8C		C						4					096/0172/0162/0	061/0		
S9B		B		-45				5					098/0170/0164/0	063/0		
S9C		C						5					097/0171/0166/0	065/0		
60A		A		0	-20			7	008/0067/0066/0				005/0058/0083/0	082/0		
61A				0	-30			7	009/0070/0076/0				004/0057/0085/0	084/0		
61B		B						7	202/0201/0200/0				099/0169/0168/0	067/0		
62A		A		-30	30			2	095/0						093/0	
62A				0	0			6	012/0073/0074/0	015/0			059/0		081/0	
63B		B						6	214/0209/0208/0	020/0			179/0		049/0	
64A		A						6	079/0078/0077/0	076/0			060/0		050/0	

1	7	13	19	25	31	37	43	49	55	61	67	7576
CLM	KL	FLN	KY	CSL	CAB	KDF	L/D	KCP				9

COEFFICIENTS:

a or B
SCHEDULES
 $\alpha A = 0.2, 0.6, 8, 10, 12, 14, 16, 20$
 $\alpha B = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40$
 $\alpha C = 40, 42, 44, 46, 48, 50, 52, 54, 56, 60$

— IDPVAR(1) IDPVAR(2) NDV
 SE (+), T.E. DOWN NR
 SA = (SE) - (SE) NR
 DR#1076 B-1-54E

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

TEST TW-478 DATA SET COLLATION SHEET

Force-Delta Wing Orbiter - 0.0035-scale Stability & Control

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCID.		PARAMETERS/VALUES				MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							NO. OF RUNS				
		a	B	SE	SA	SE	SA	0.6	0.9	1.0	1.2	1.46	1.96	2.99		4.96			
Q2764B	BSWITE10V17J2K	B	0	0	0	0	0	-20		211/0	212/0	213/0	214/0		179/0		150/0		6
65A		A						0	120	100/0									1
66A									90	99/0									1
67A								-30	120	101/0									1
68A									90	98/0									1
69A								-30	120	102/0									1
70A									90	97/0									1
71D		0	D	0	0	15			120	130/0									1
72D									90	107/0									1
73D										108/0									7
74D		15								117/0									7
75D		30																	5
76D		45																	5
77D								0											1
78D		30																	1
79D		0						-10		112/0		111/0							3
80D		15								118/0		119/0							3
81D	BSWITE10X	0						0											5
82D		15																	5
83D		30																	5

1	7	13	19	25	31	37	43	49	55	61	67	73
CLM	CLN	CLY	CLZ	CLX	CLB	CLD	CLE	CLF	CLG	CLH	CLI	CLJ

COEFFICIENTS:
 a or B
 SCHEDULES
 CA = 0.2, 4, 6, 8, 10, 12, 14, 16, 18, 20
 CB = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40
 CD = -4, -2, 0, 2, 4, 6, 8, 10

Force-Delta Wing Orbiter - 0.0035-Scale Stability & Control

PRETEST

POSTTEST

ORIGINAL PAGE IS
OF POOR QUALITY

[illegible]

	7	13	19	25	31	37	43	49	55	61	67	75	76
SLM	KL	KLN	ISY	ISL	FAB	FDF	IL/D	XCP					9
COEFFICIENTS:													
<div style="display: flex; justify-content: space-between;"> _____ _____ _____ _____ _____ </div>													

COEFFICIENTS: $\text{TPDVAR}(1) \mid \text{TPDVAR}(2) \mid \text{NDV}$

DELTA WING ORBITER

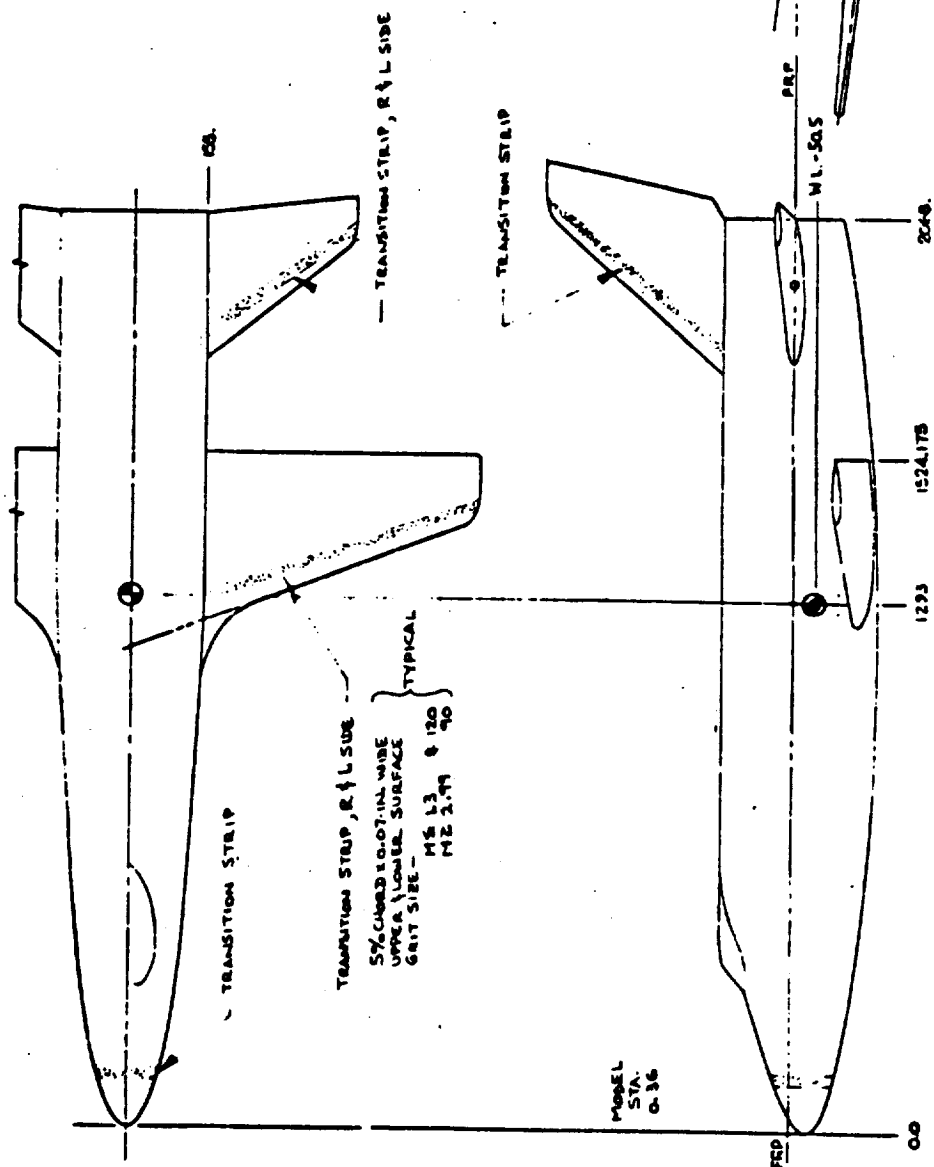
NR

DR#1076 B-1- 547

FIGURE 2.
STRAIGHT WING SSV ORBITER

Reference Drawing 9992-130C

Note: Wing is in -130G position



ORIGINAL PAGE IS
OF POOR QUALITY

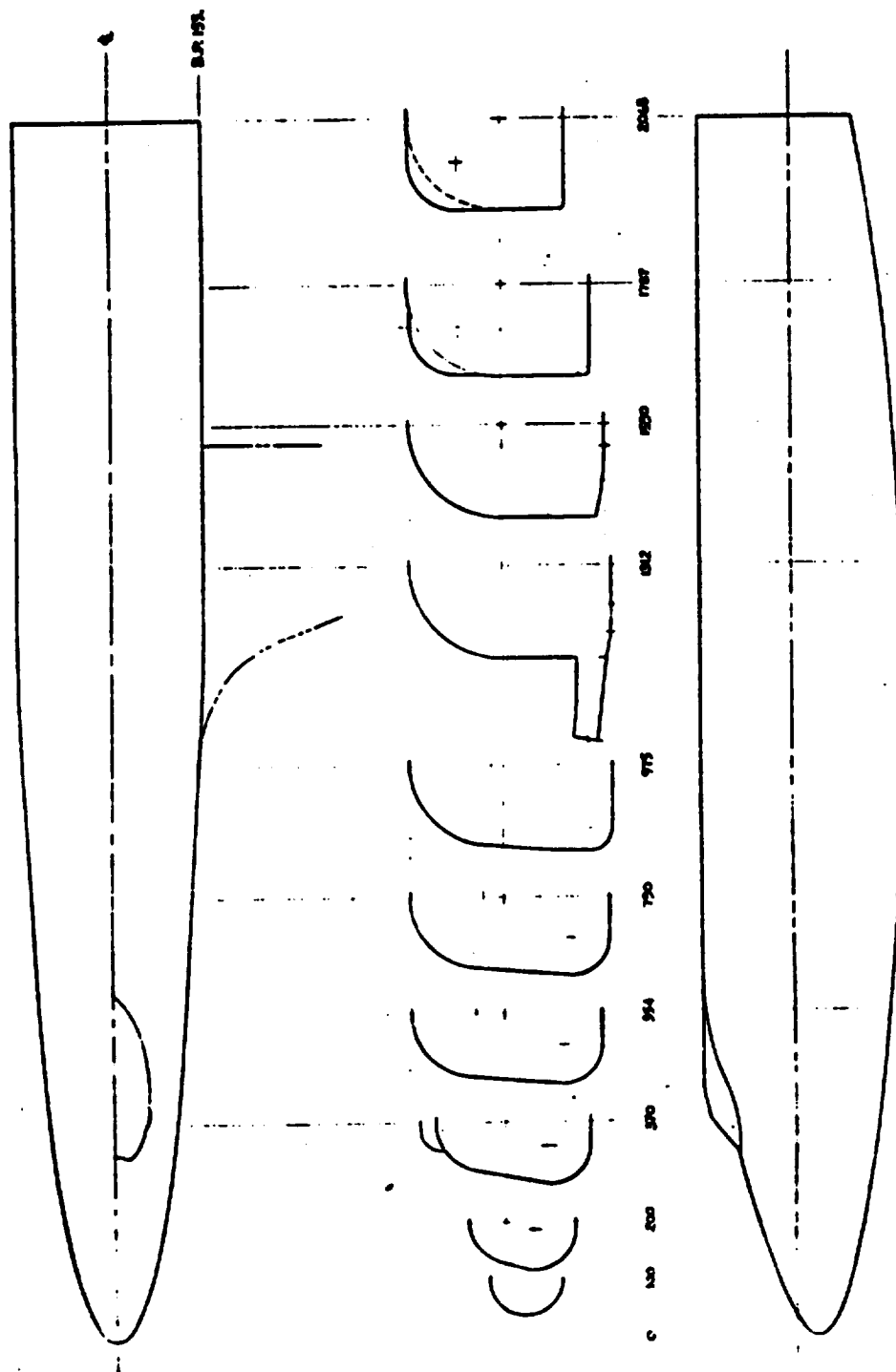


FIGURE 3. BODY B6 9992-130 C CONFIGURATION

DELTA WING ORBITER
NR
DR#1076 B-1- 549

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

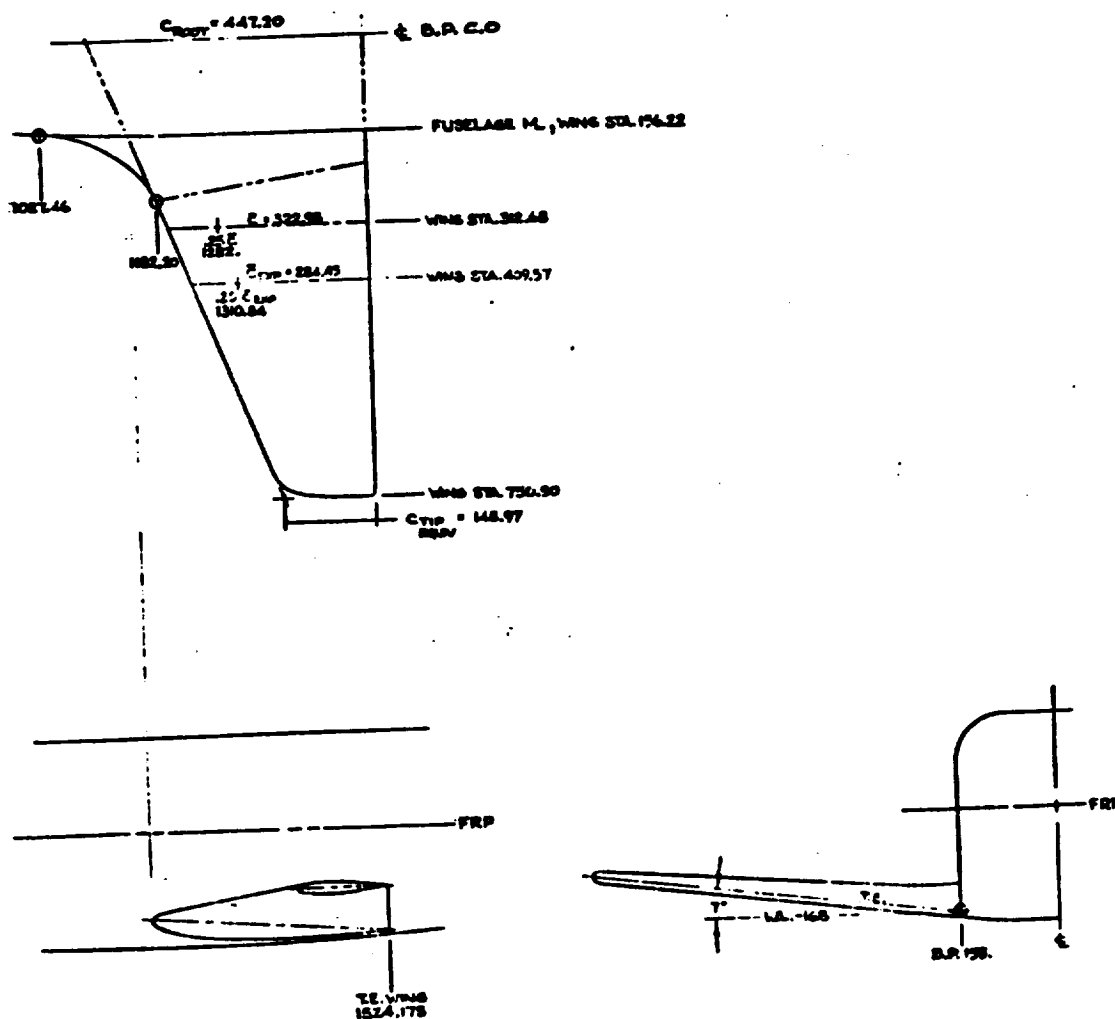
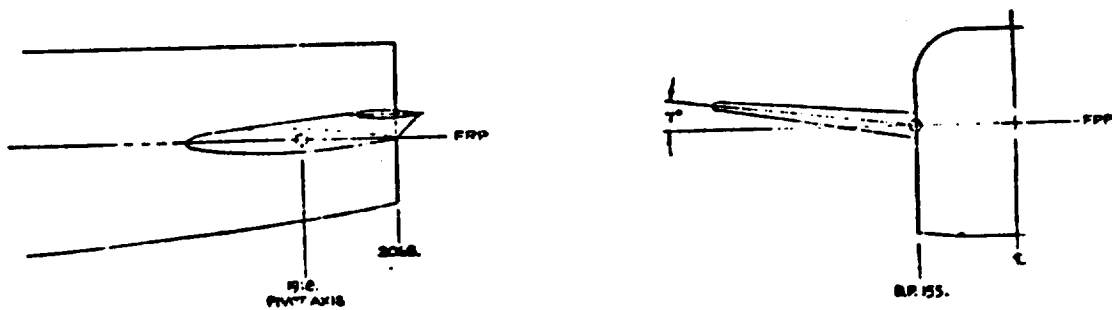


FIGURE 4.

WING WIO

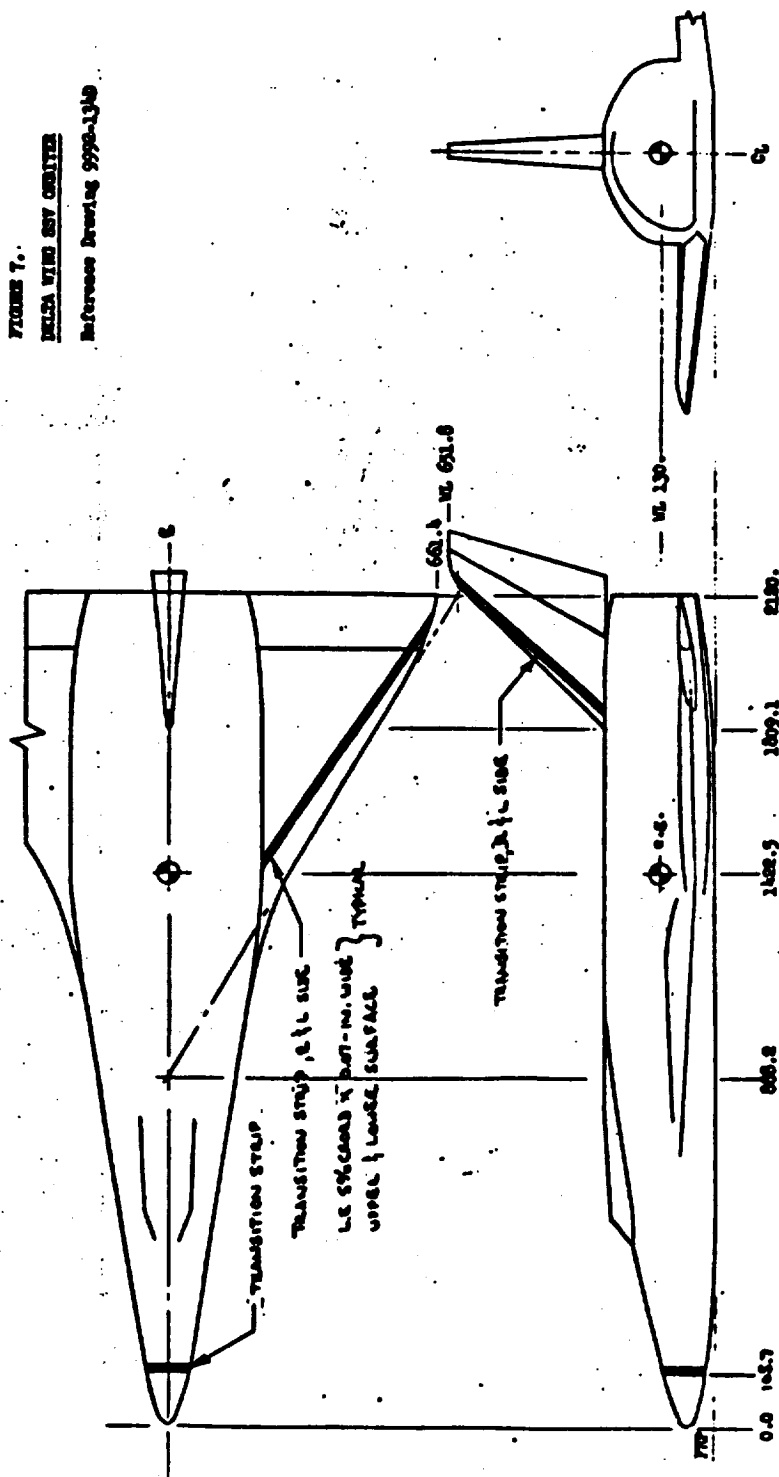
9992-130 C CONFIGURATION
9992-130 G WING POSITION

DELTA WING ORBITER
NR
DR#1076 B-1- 551



653

FIGURE 7.
DELTA WING ORBITER
Reference Drawing 9990-1340



ORIGINAL PAGE IS
OF POOR QUALITY

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1076 B-1- 663

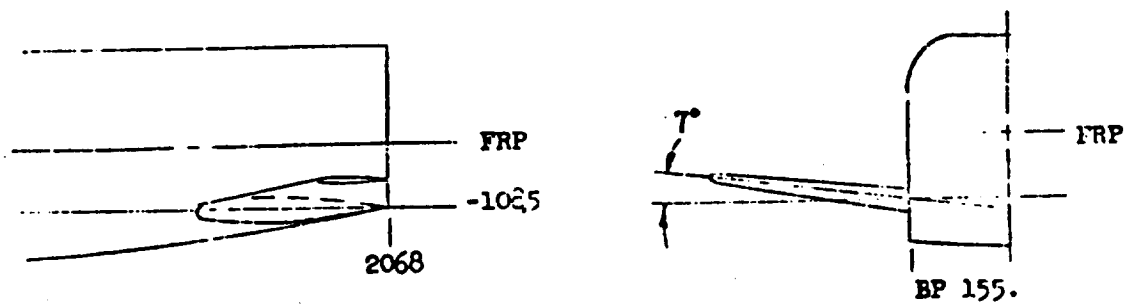
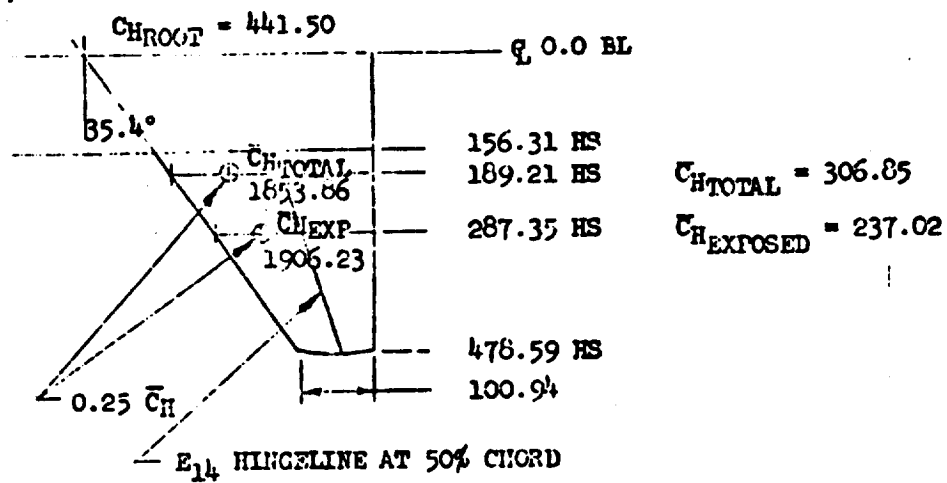


FIGURE 6. HORIZONTAL STABILIZER H_{16} AND
ELEVATOR E_{14}

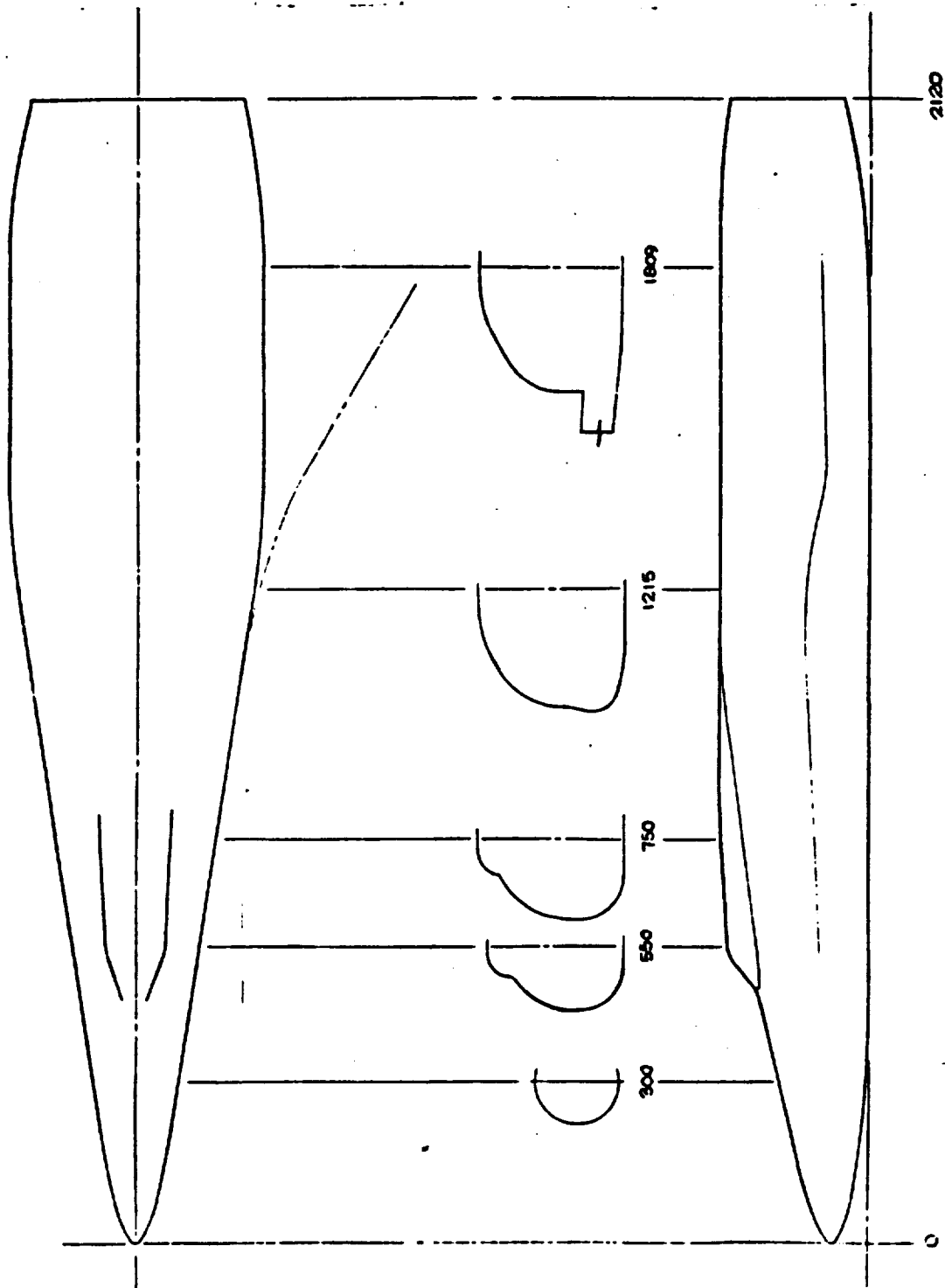
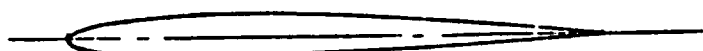
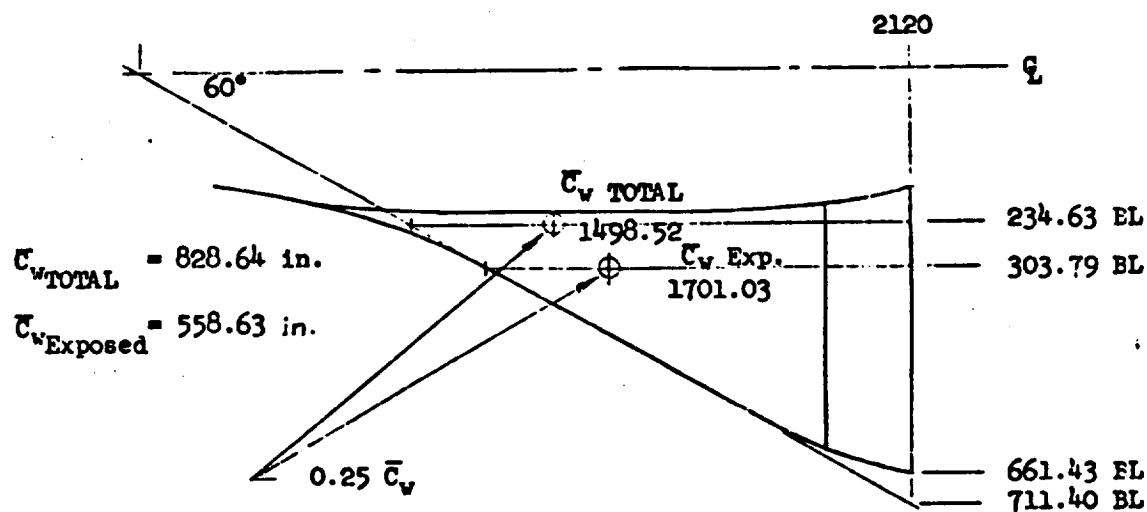


FIGURE 8. BCDY 25 9992-134B CONFIGURATION

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER
NR
DR#1078 B-1- 555



CHORD (BL 241.80)
0009-64 SERIES AIRFOIL



TIP CHORD (BL 546.07)
0012-64 SERIES AIRFOIL

FIGURE 9. WING W₁₇ 9992-134 D Configuration

DELTA WING ORBITER
NR
DR#1076 B-1- 556

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

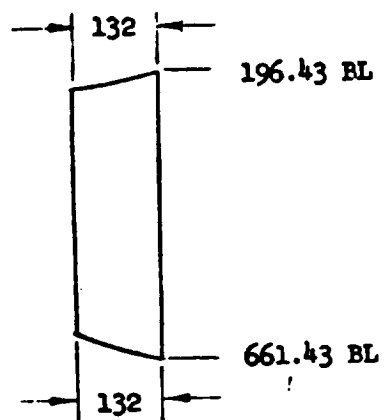


FIGURE 10. ELEVON, E 10-ELEVON USED WITH WING W17

CRITICAL PATHS
OF FLOW VELOCITY

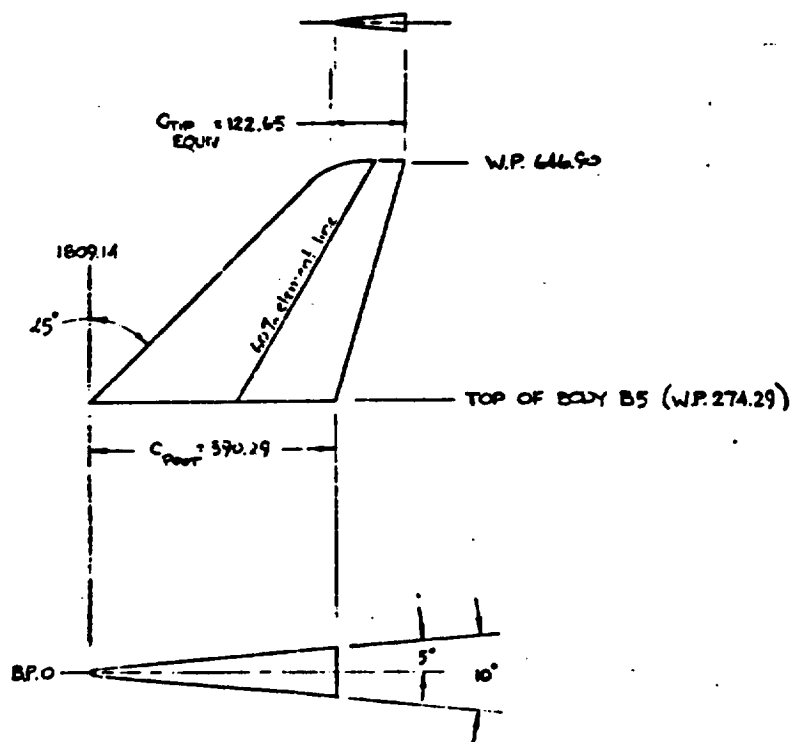
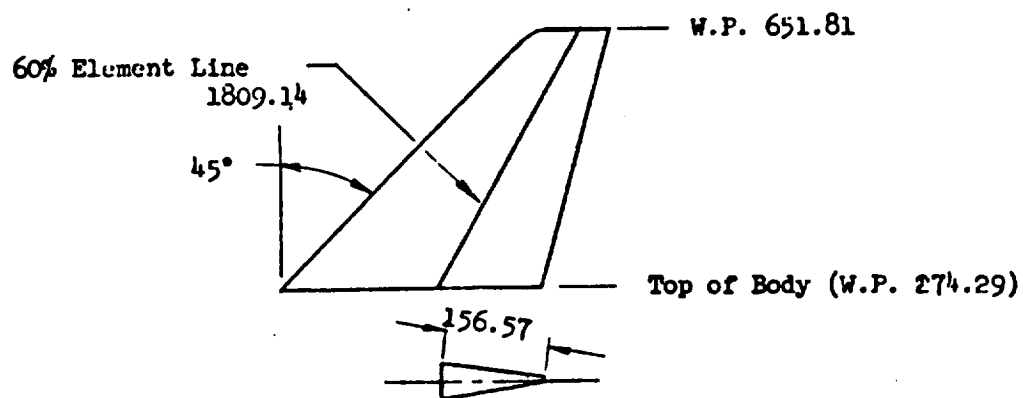
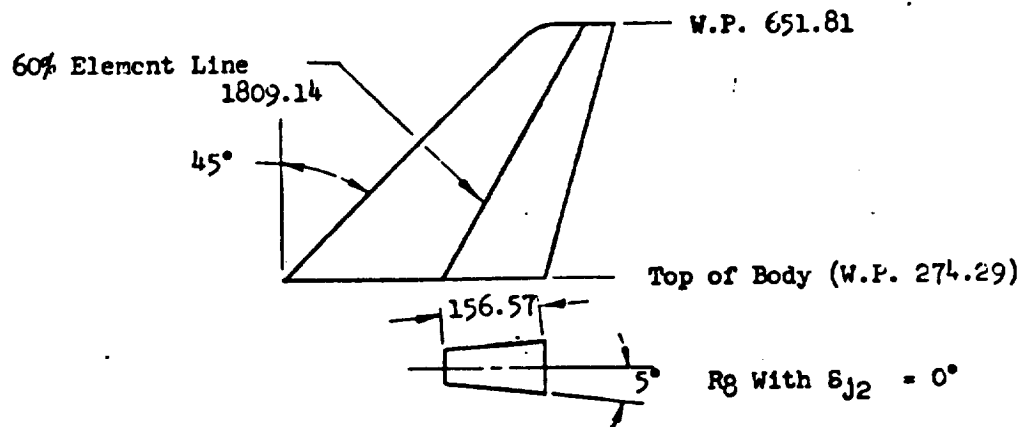


FIGURE 11.
VERTICAL STABILIZER V17



VERTICAL TAIL V 16



VERTICAL TAIL V 17

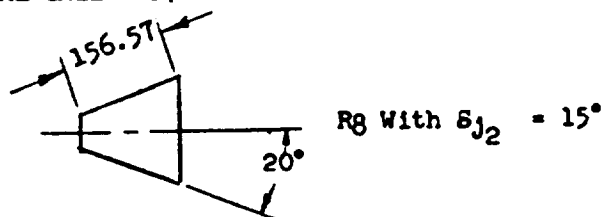


FIGURE 12. DRAG BRAKE J 2

Delta-Wing Orbiters

☐ **PRETEST**

POSTTEST

DELTA WING ORBITER
NR
DR#1078 B-1- 559

DATA SET IDENTIFIER	CONFIGURATION	RUM MODE	SCHU.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS							
			A	B	δ ₀	δ ₁	δ ₂		0.25	0.6	0.9	1.2	1.5	2.0		
PA FOIA	BHW9EH	P	A	O	O	-	S	3								
	↓		C		O	-	L	3		139			138			137
O2A	BHW8EHV10		A		-15	-	S	3		194			193			192
O2C	↓		C		-15	-	L	3		133			132			131
O3A	↓		A		-30	-	S	3		197			196			195
O3C	↓		C		-30	-	L	3		136			135			134
O4C	BHW16E7		C		O	-	L	5		200			199			198
O5C	↓		C		-15	-	L	5		21	20		19	18		17
O6C	↓		C		-30	-	L	6		57	56		55	54		53
O7C	↓		C		-45	-	L	6	46	115	44		43	42		41
O8C	↓		C		-45L -15R	-	L	5	52	51	50		49	48		47
O9A	BHW16E7V21		A		O	O	L	5		63	62		61	60		59
10A	↓		A		O	O	S	6	107	5	4		3	2		1
11A	↓		A		-15	O	S	5		106	105		104	103		102
12A	↓		A		-30	O	S	6	114	113	112		111	110		109
13A	↓		A		-45	O	S	5		130	129		128	127		126
14A	↓		A		-45L -15R	O	S	6	120	119	118		117	116		115
15A	BHW16E7V21R		A		O	O	S	6	101	100	99		98	97		96
16I	BHW16E7V2133		I		O	15	L	5	205	204	203		202			201
17I	BHW16E7V26		I		O	O	L	5	210	209	208		207			206

$$A = -10, -7, -4, -2, 0, +2, 4, 6, 8, 11, 14, 18$$

OF B
SCHEDULES
C = 20, 24, 28, 32, 34, 36, 40

$$I = 0, 2, 4, 6, 8, 11, 14, 18, 22, \text{MAX}$$
$$\varepsilon = -5, -2, 0, +2, +4, 6, 10$$

DELTA WING ORBITER
NR
DR#1078 B-1- 560
☐ PRETEST

Delta-wing Orbiter

[illegible]

TEST Ames 66-503 DATA SET COLLATION SHEET

Delta - Wing Orbiter

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	RUN MODE	SCHID.		CONTROL DEFLECTION NO. of RUNS			MACH NUMBERS							
			a	b	δ_x	δ_y	δ_{yaw}	0.6	0.7	0.9	1.2	1.5	2.0		
RAE 134	BWAE4V10	RAH	E	0	0	-	L	130	129	128	127	126	125		
RAE 135		↓	F	0	0	-	L	125	124	123	122	121	120		
RAE 136		YAW	-5	K	0	-	L	115	114	113	112	111	110		
RAE 137		↓	30	K	0	-	L	120	119	118	117	116	115		

7	13	19	25	31	37	43	49	55	61	67	73	79
CA	ICAB	ELM	KY	CYN	CL							

COEFFICIENTS:

a of B

SCHEDULES

$B = -15, -12, -9, -4, -2, 0, 2, 4, 6, 8, 10$

$F = 12, 15, 18, 21, 24, 27, 30, 33, 36, 40$

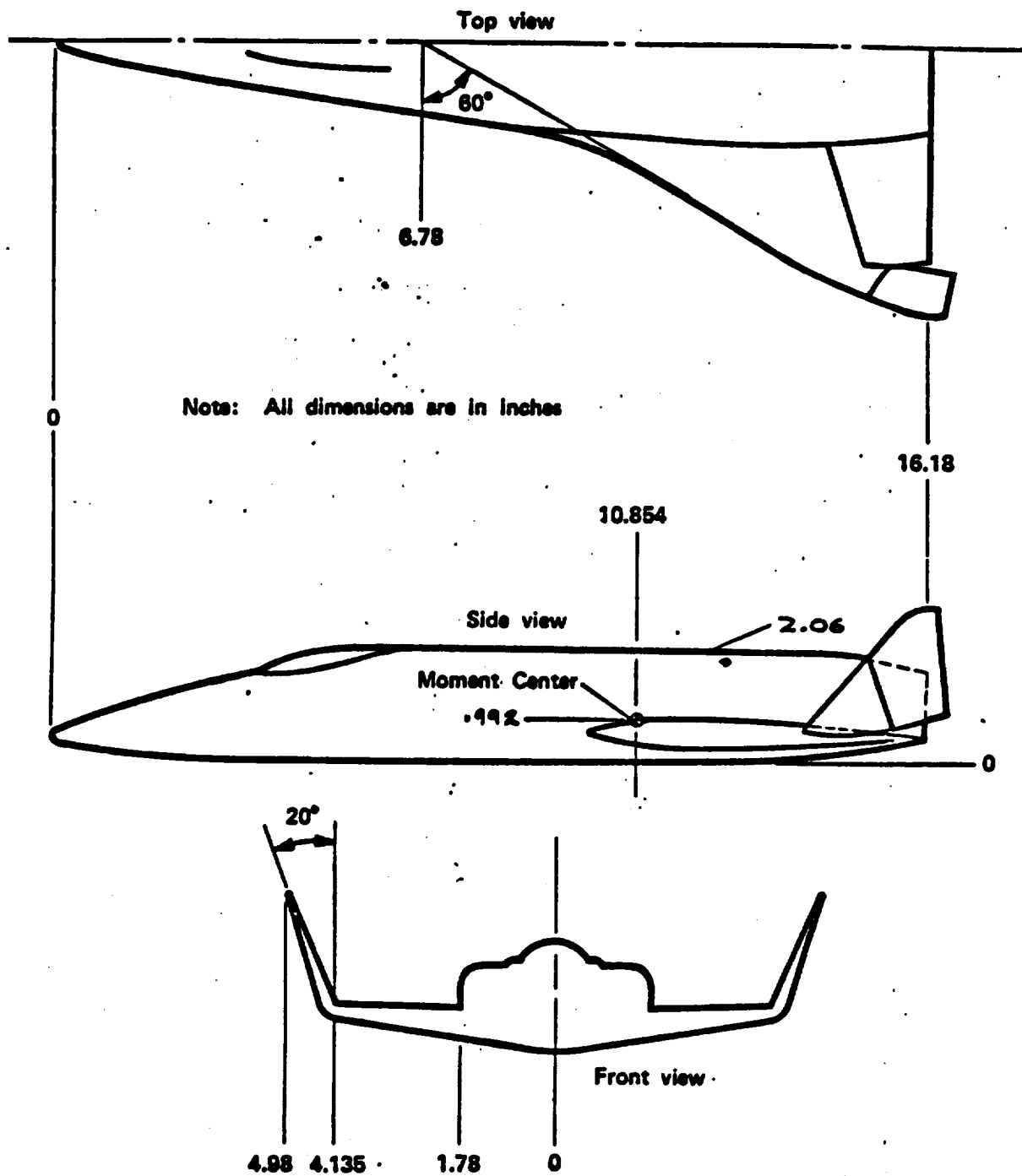
$K = -5, -2, 0, 2, 4, 6, 10$

$\rightarrow IDPVAR(1) IDPVAR(2) IDV$

ORIGINAL PAGE IS
OF POOR QUALITY

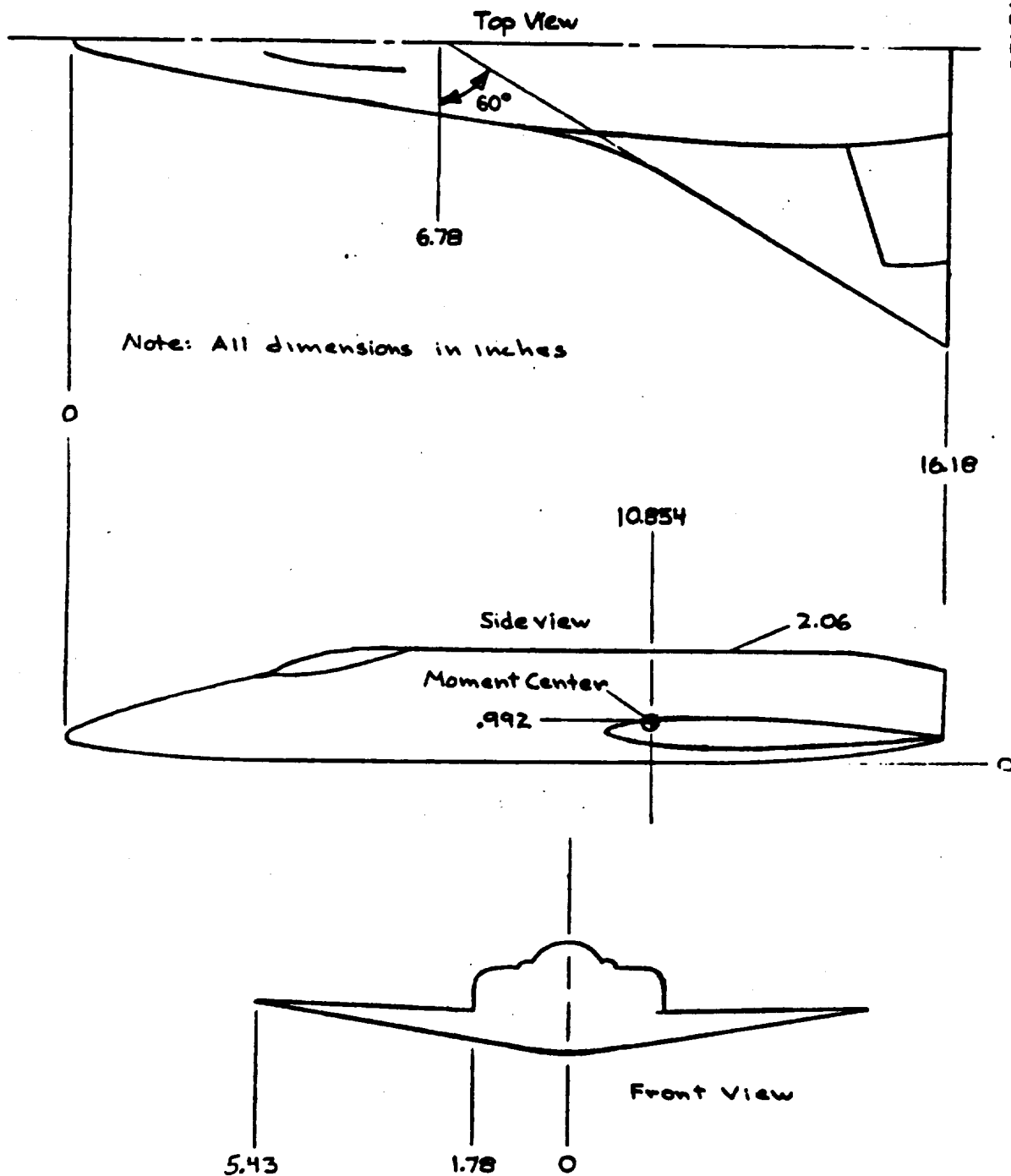
DELTA WING ORBITER
NR
DR#1078 B-1- 561

NAR Delta-wing orbiter model for Ames 6' x 6' wind tunnel tests

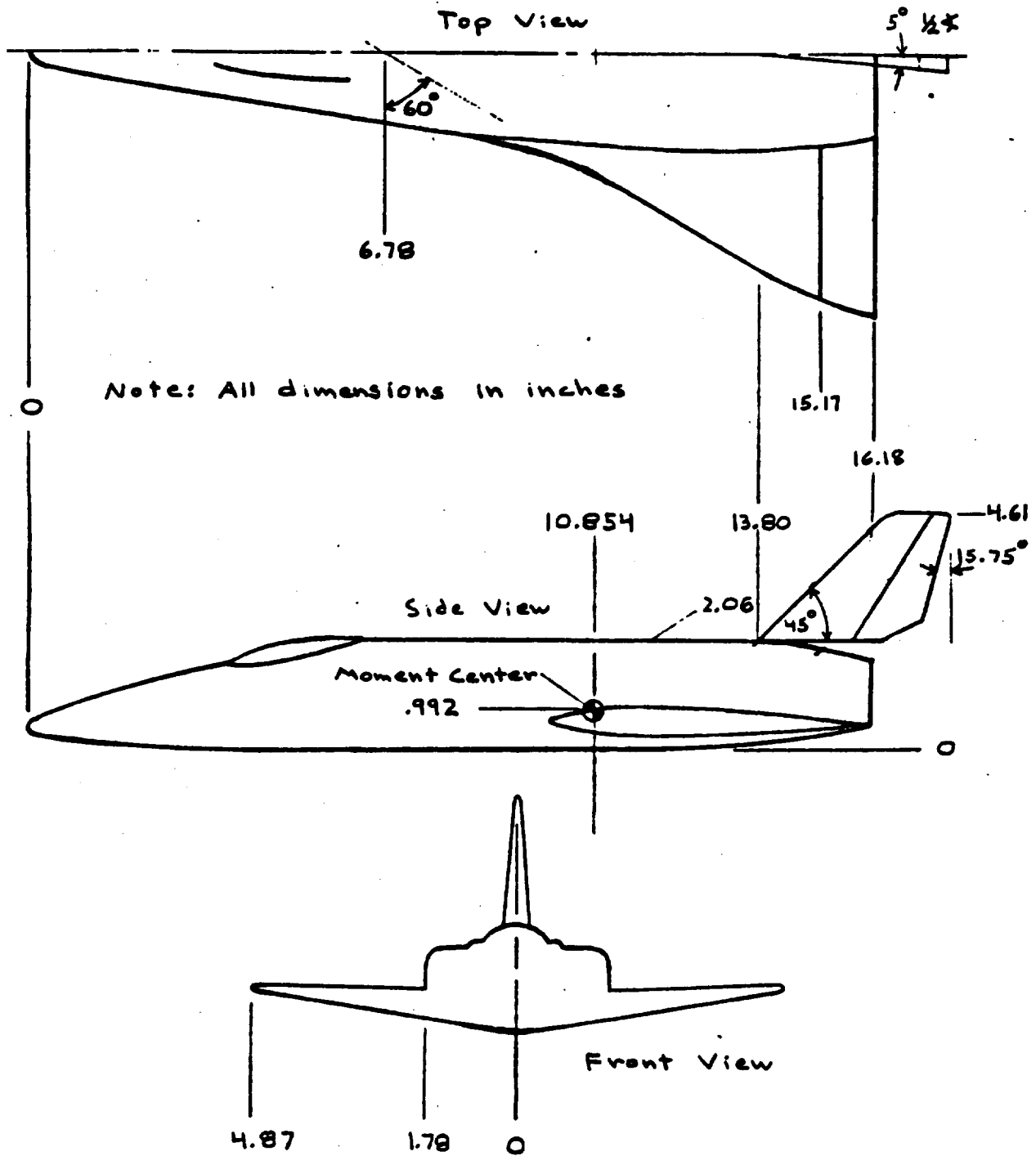


(a) B4WBE4V10

Sketch 1 - NAR Delta Wing Orbiter, Three-View



(b) B4W9E4
Sketch 1 - continued



(C) B4W16E7V21
Sketch 1 - concluded

Vertical Tail Sketches

Tip Chord

.912"

w.p. = 4.61"

Hinge line for varying wedge angle - 60% chord line

Side View

15.75°

ORIGINAL PAGE IS
OF POOR QUALITY

Top of
Body
(w.p. = 2.06")

F.S. 13.8

Root Chord = 2.98"

Void Area to allow
sting mounting
with angle adapter
(area varies from
tail to tail)

Bottom View
where tail
joins body

10°

V 21

40°

15°

10°

V 2133

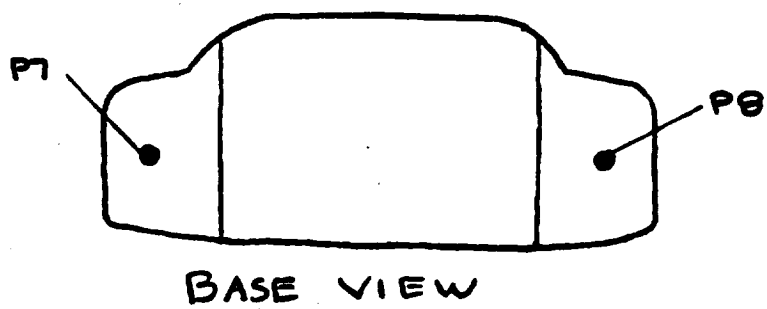
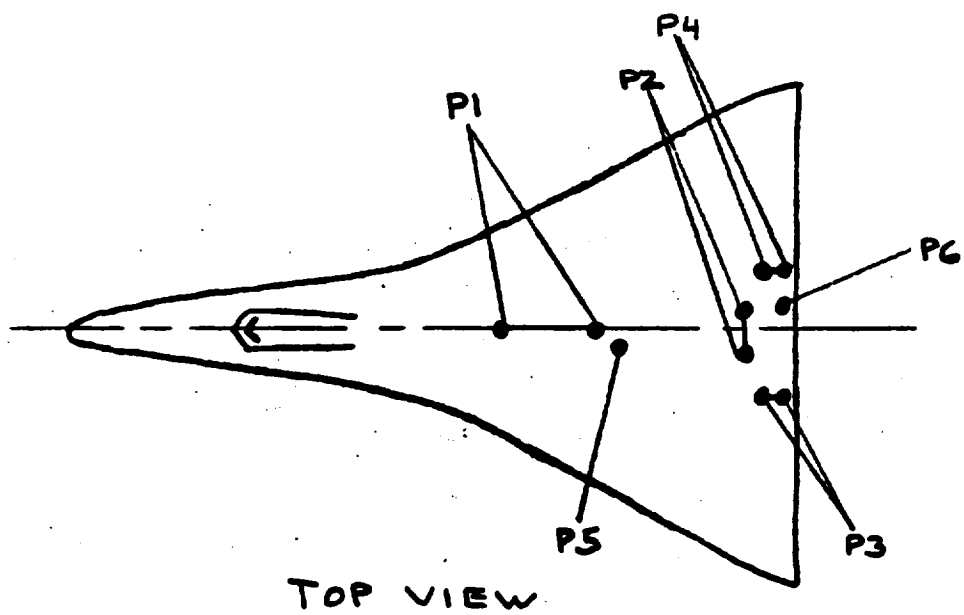
10°

15°

V 26

Sketch 2 - Vertical Tails

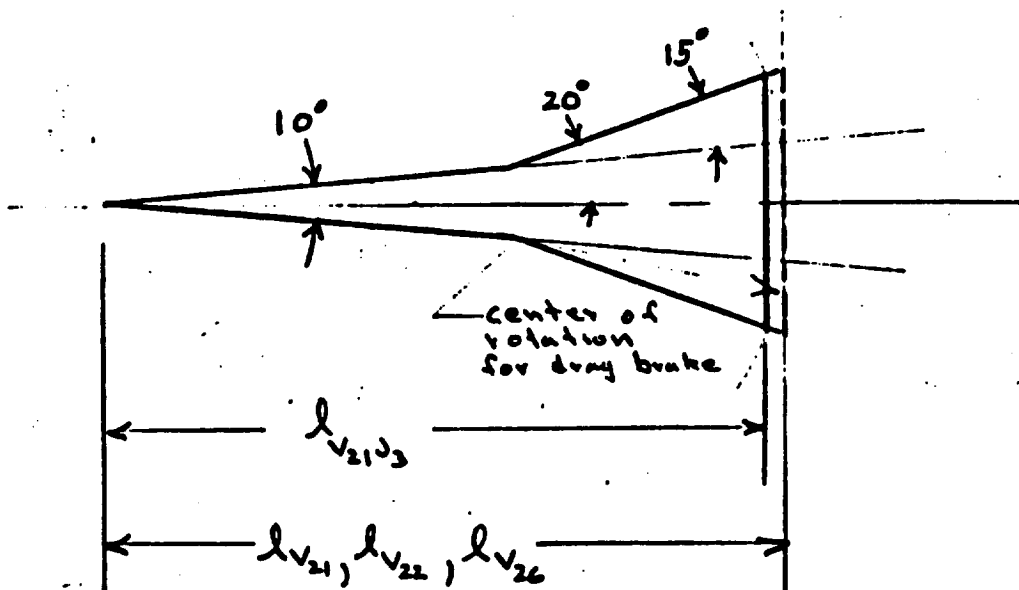
DELTA WING ORBITER
NR
DR#1078 B-1- 566



Sketch 5 - Pressure tap locations

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER
NR
DR#1078 B-1- 567



$l_{V_{21}J_3} < l_{V_{21}}$ or $l_{V_{22}}$ because drag brake panels J_3 are swung out from V_{21} position which results in over all length that is less than for V_{21} .
 $l_{V_{22}}$ was made with length equal to $l_{V_{21}}$.

TEST LR-CFMT 63A DATA SET COLLATION SHEET

TEST DATE 3/10-11/71

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES		NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)													
		A	B	SR	ST		10.0													
RLQ001	B4Z	A	0	-	-															
02	↓	B	5	-	-		3													
03	B4ZW16	A	0	-	-		4													
04	↓	B	5	-	-		5													
05	B4ZW16V24	A	0	0	0		6													
06	↓	B	5	0	0		7													
07	B4ZW16V24R8	A	0	-20	0		8													
08	↓	B	5	-20	0		9													
09	B4ZW16V24J	A	0	0	15		10													
10	↓	B	5	0	15		11													
11	↓	A	0	0	30		12													
12	↓	B	5	0	30		13													
							14													

1 7 13 19 25 31 37 43 49 55 61 67 73 79

BETA R(P5F) CN CA KLM CBL CYN FY

COEFFICIENTS: A) 0, 3, 6, 9, 12, 14, 16, 19, 22, 26, 30, IDPVAR(1) IDPVAR(2) IDP

B) 0, 30, 36, 22, 19, 16, 14, 12, 9, 6, 3, 0

SCHEDULES

LARC
TEST 31st CENT - 63A DATA SET - ORGANIZATION - SHEET
TEST DATE 4/26-30/71

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		a	b	dR	dJ		10.0									
RL0013	B4ZW10V24J	A	0	0	30	0	2120	1								
014	✓	B	5		✓											
015	B4ZW10V24	A	0		0											
016	B4ZW10V24															
017																
018																
019																
020																
021																
022																
023																
024																
025																
026	B4ZW10V24															
027	B4ZW10V24J															
028	B4ZW10V24R2															
029	B4ZW10V24JR3															
030																
031																
032																

DELTA WING ORBITER
NR
DR#1084 B-1- 569

a(A) = 0, 3, 6, 9, 12, 14, 16, 19, 22, 26, 30, 0
d(B) = 30, 26, 22, 19, 16, 14, 12, 9, 6, 3, 0

LAOC
TEST 3rd FHT-63B DATA SET - ORGANIZATION - SHEET

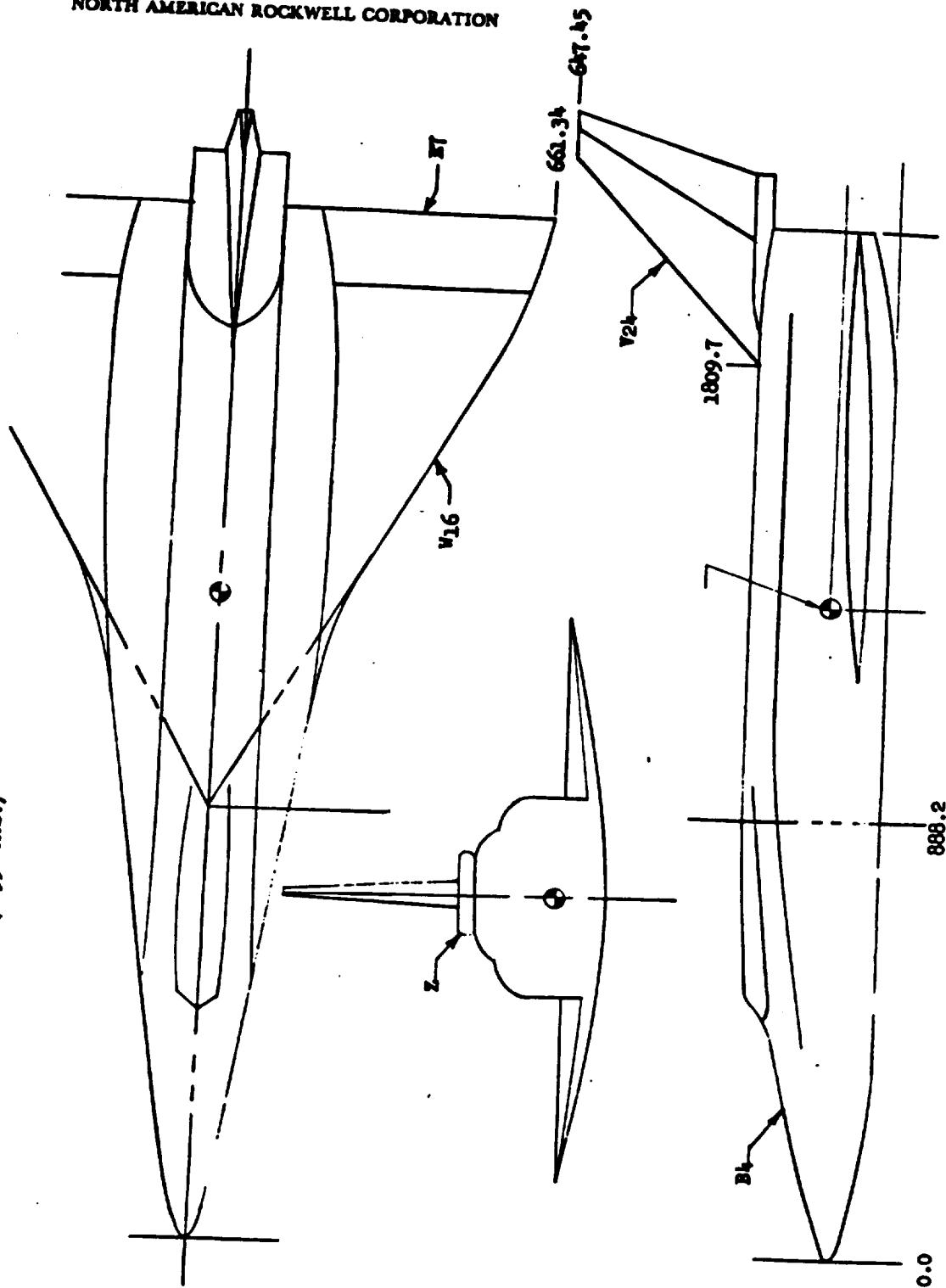
DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. OF RUNS	MACH NUMBERS									
		a	b	SR	ST	Wing		10.0									
RUGO-33	B1ZW19	A	0	-	-	0	210	1	39								
031	B1ZW20			-	-	-	207		40								
035	B7Z			-	-	-	-		41								
036	B7ZW16			-	-	0	212		42								
037	B7ZW16 V14			0	0	✓	-		43								
038	B7ZW16 V14			-	-	-15	-		44								
039	✓			-	-	-30	-		45								

$\Delta(N) = 0, 3, 6, 9, 12, 14, 16, 19, 22, 26, 30, 0$

$X_{c.g.} = 1422.5 \text{ in. (10.854 M.S.)}$

$Z_{c.g.} = 130.0 \text{ in. (0.992 M.S.)}$

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION



2120.0
DELTA WING ORBITER
NR
DR#1084 B-1- 571

FIGURE 7. 3 VIEW SKETCH-DELTA WING ORBITER

DELTA WING ORBITER
NR
DR#1084 B-1- 672

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

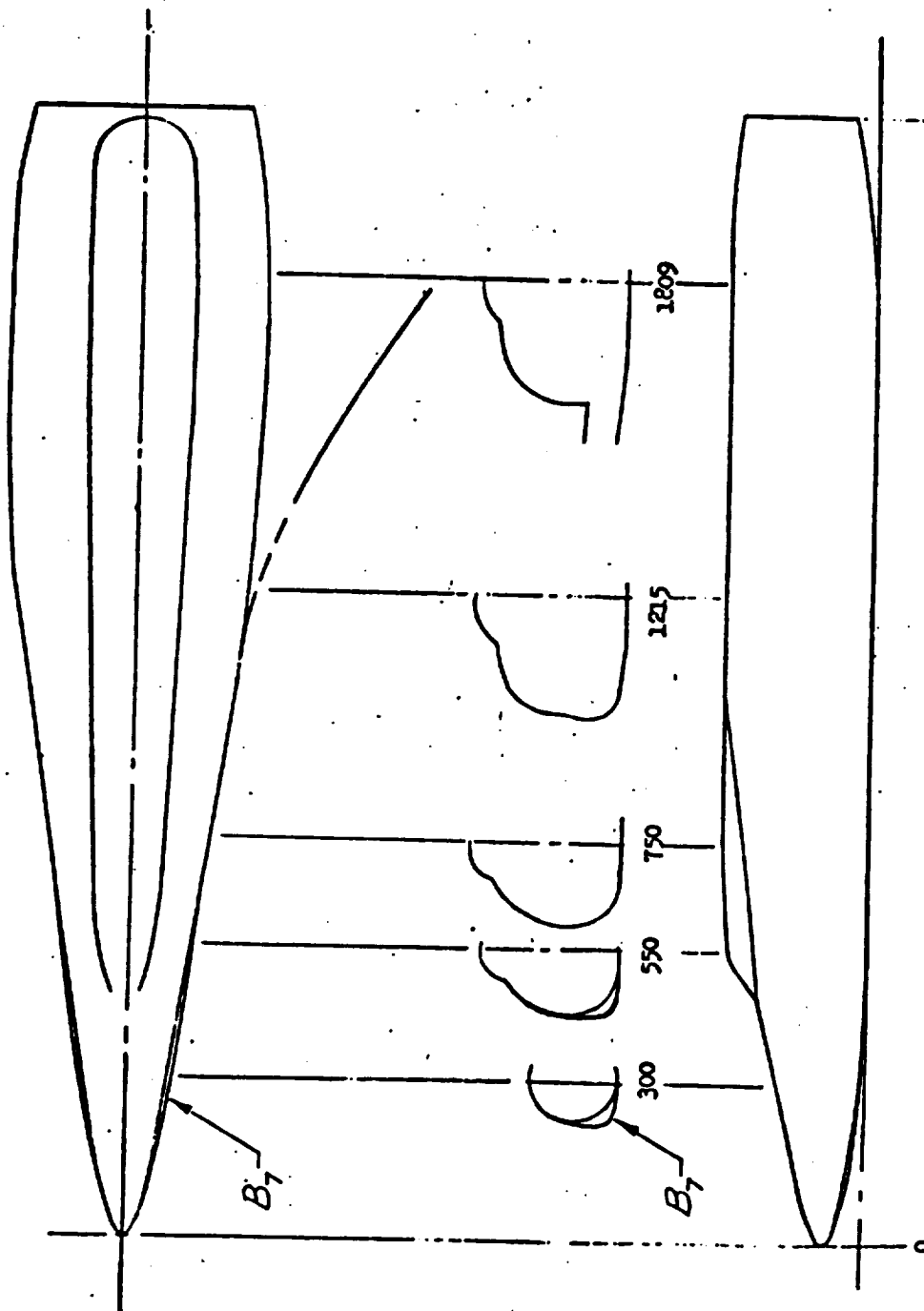


FIGURE 8. BODY B4 9992-129 CONFIGURATION
Body B7 9992-129 Configuration With 161 Nose Modification

TRAILING EDGES OF VERTICAL TAILS & RUDDERS- DELTA WING ORBITER

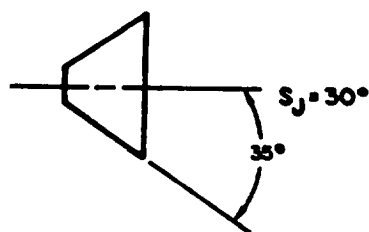
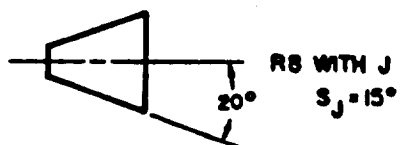
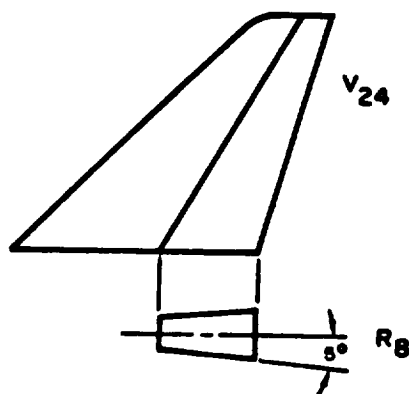
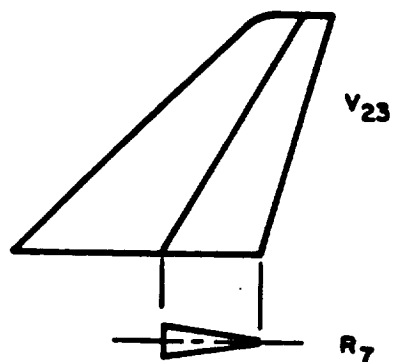


FIGURE 9. Trailing Edges of Vertical Tails and Rudders

WING	$\bar{C}_{w/4}$	\bar{C}
W ₁₆	1498.15 IN.	829.20 IN.
W ₁₈	1493.71 IN.	835.12 IN.
W ₁₉	1548.22 IN.	829.20 IN.
W ₂₀	1448.09 IN.	829.20 IN.

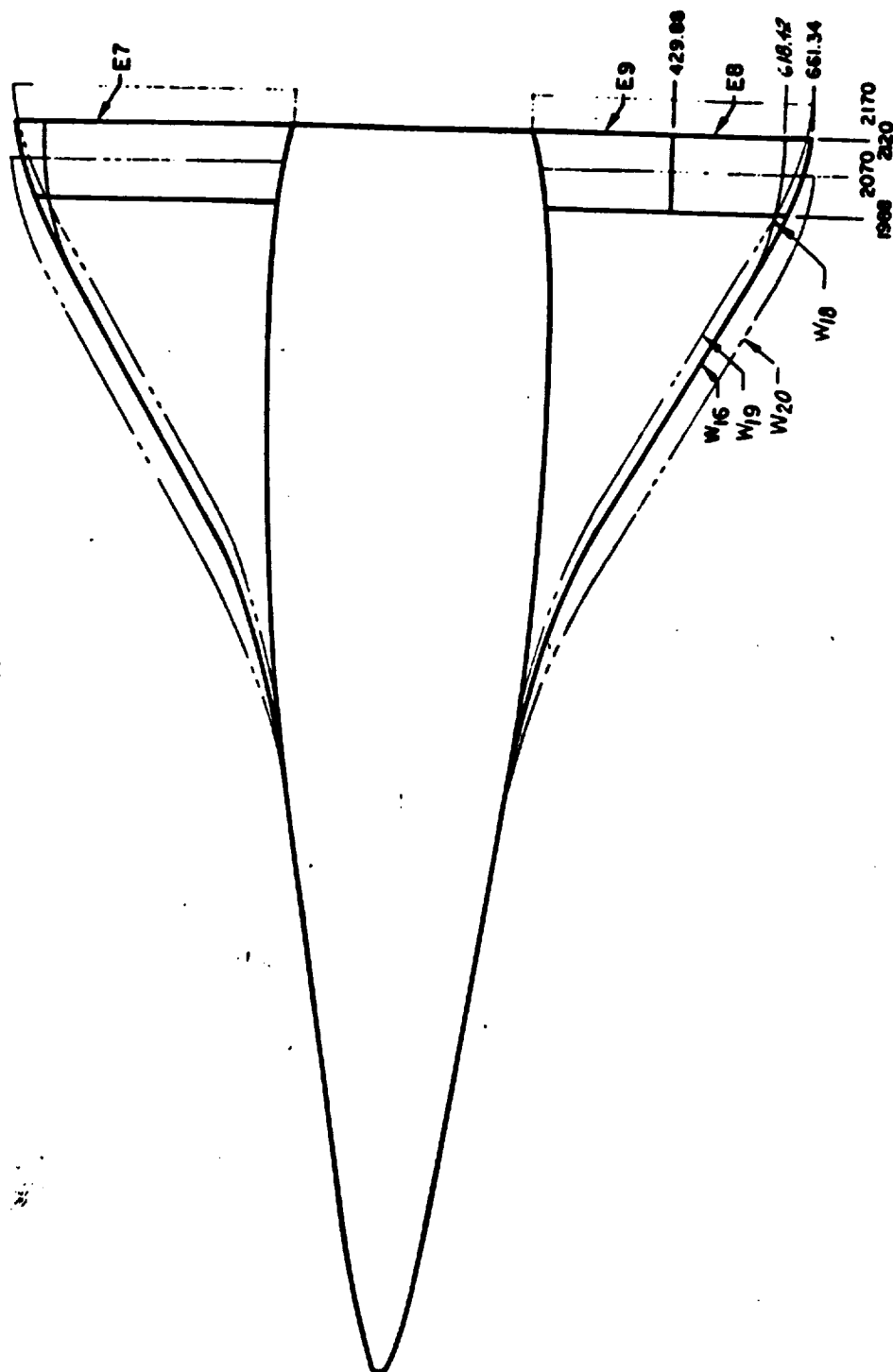


FIGURE 10. ALTERNATE WING POSITIONS

TEST 22" Helium 7376 DATA SET ORGANIZATION SHEET

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES					NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		α	β	δ _{EL}	δ _{EP}	δ _e	δ _a	20.3											
RLV001	B5W17E1OV17	A	0	0	0	0	0	0	1	1									
3				-10	-10	-10	0			3									
4				-10	+10	0	-10			4									
5				0	+10	5	-5			5									
6	↓			-15	-15	-15	0			6									
7	B5W17E10			0	0	0	0			7									
8	B5		↓	-	-	-	-			8									
11	B5		4.5	-	-	-	-			11									
12	B5W17E10			0	0	0	0			12									
13	B5W17E1OV17			0	0	0	0			13									
14	B5W17E1OV17		↓	-10	-10	-10	0			14									

ALPHA - A - 0, 4, 8, 12, 14, 16, 18, 20, 22, 25, 28, 31, 34, 37

α or β
SCHEDULES

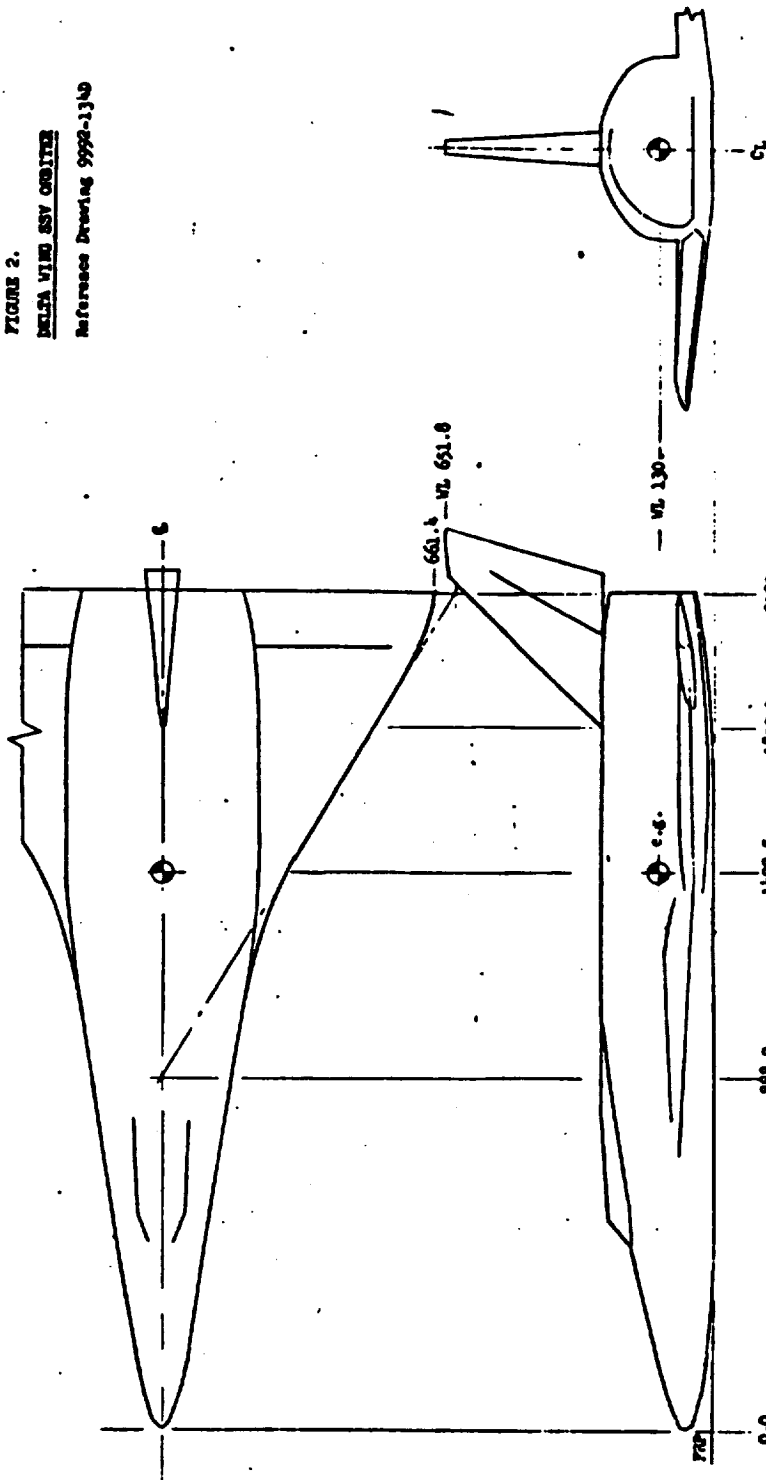
DELTA WING ORBITER
NR
DR#1088 B-1- 575

2.

FIGURE 2.

DELTA WING OSV ORBITER

Reference Drawing 9992-1340



ORIGINAL PAGE IS
OF POOR QUALITY

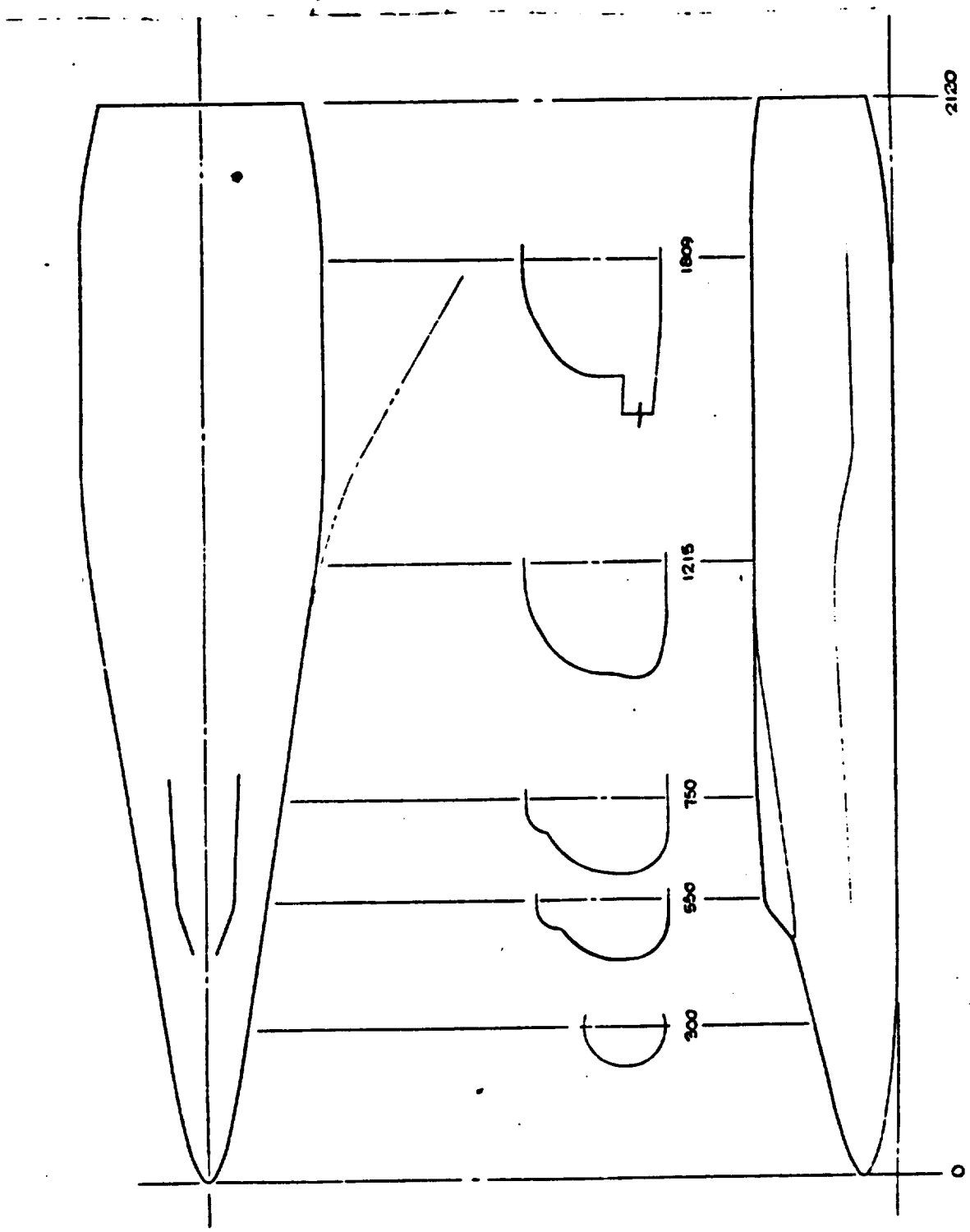


FIGURE 3. BODY 25 9:92-13.4 B CONFIGURATION

DELTA WING ORBITER
NR
DR#1088 B-1- 577

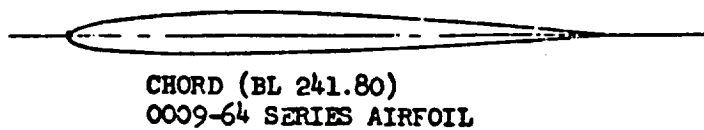
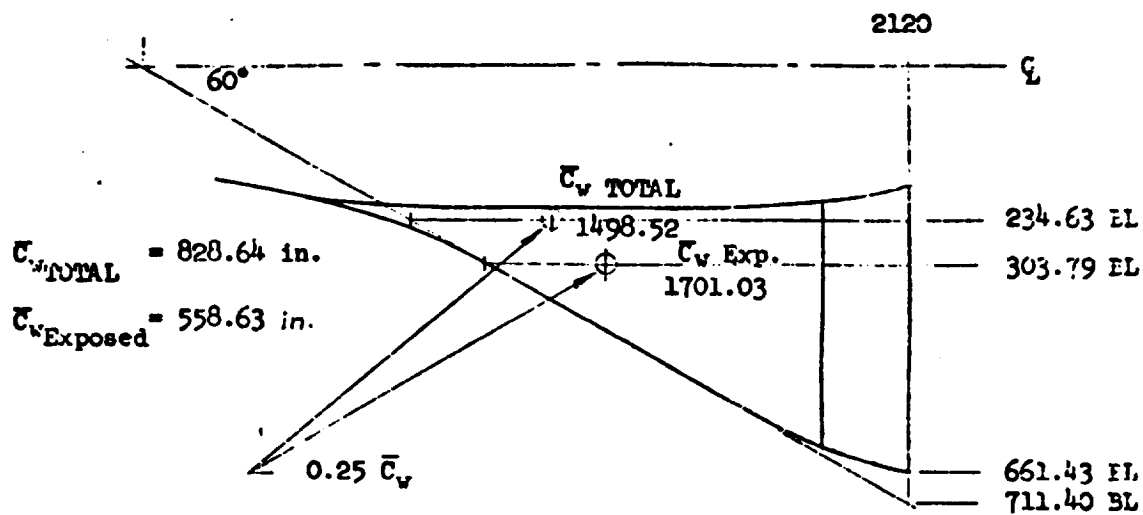


FIGURE 4. WING W₁₇ 9992-134 D Configuration

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1088 B-1- 579

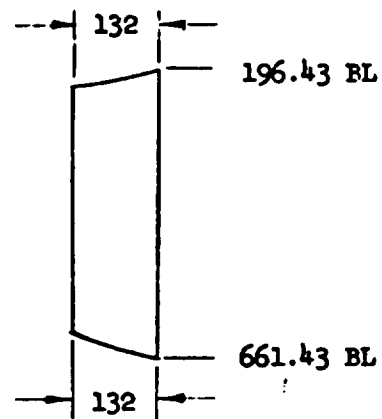


FIGURE 5. ELEVON, E 10-ELEVON USED WITH WING W17

DELTA WING ORBITER
NR
DR#1088 B-1-580

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

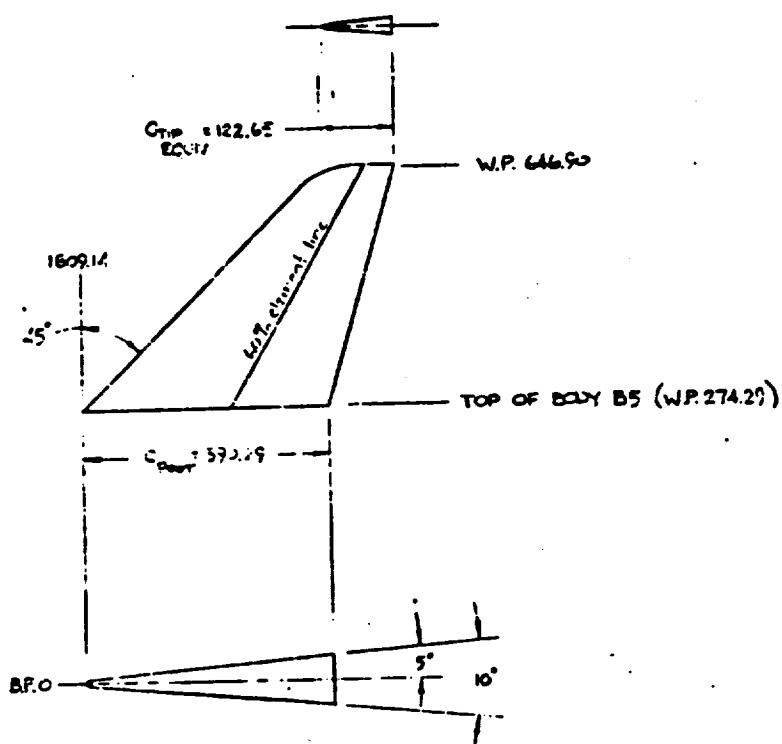


FIGURE 6.
VERTICAL STABILIZER V17

ORIGINAL PAGE IS
OF POOR QUALITY

☐ PRETEST ☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		PARAMETERS/VALUES		NO. OF RUNS	MACH. NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						
		A	B	SE									
RT600A	BSWITE10VIZX	A	0	0		7	24	0.6	2.9	10	11	1.2	1.3
RT601A		A	0	0		7	30	4.0	5.0	4.0	10.0	4.0	12.0
RT610A		A	0	0		5	18	19.0	5.0	2.0	—	3.0	—
RT620A		A	0	-10		7	25	26.0	29.0	30.0	31.0	32.0	33.0
RT600B		A	0	-30		7	36	37.0	38.0	39.0	40.0	41.0	42.0
RT600C		B	0	0		7	45	46.0	47.0	48.0	49.0	50.0	51.0
RT600C		C	0	0		7	54	55.0	56.0	57.0	58.0	59.0	60.0
RT600D		D	0	0		7	67	68.0	69.0	70.0	71.0	72.0	73.0
RT610B		B	0	-10		7	87	88.0	89.0	90.0	91.0	92.0	93.0
RT610C		C	0	-10		7	106	107.0	108.0	109.0	110.0	111.0	112.0
RT620B		B	0	-30		7	126	127.0	128.0	129.0	130.0	131.0	132.0
RT620C		C	0	-30		7	145	146.0	147.0	148.0	149.0	150.0	151.0
RT601B		B	0	0		7	178	179.0	180.0	181.0	182.0	183.0	184.0
RT600R	BSWITE10VIZX	B	0	0		1	125	126	127	128	129	130	131

	7	13	19	25	31	37	43	49	55	61	67	75.76
CLM	CM	CAE	CAB	CYN	CY	CBL	CL	CDF	YCP			1.0
COEFFICIENTS: $\Delta A = 0.720$ $ND = 60 \rightarrow 70$												
										\rightarrow IDPVAR(1)	IDPVAR(2)	NDV

COEFFICIENTS:

Page 8

SCHEDULES

$$KD = 60 \rightarrow 70$$
$$\alpha B = 20 - 50$$

DC-40-761

100

683

DELTA WING ORBITER
NR
DR#1092 B-1- 581

ORIGINAL PAGE IS
OF POOR QUALITY

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

NA-7 446
7-22 10
Page 22

3.0 MODEL DESCRIPTION - Continued
3.3 Dimensional Data - Continued
3.3.2 Delta Wing Orbiter - Continued

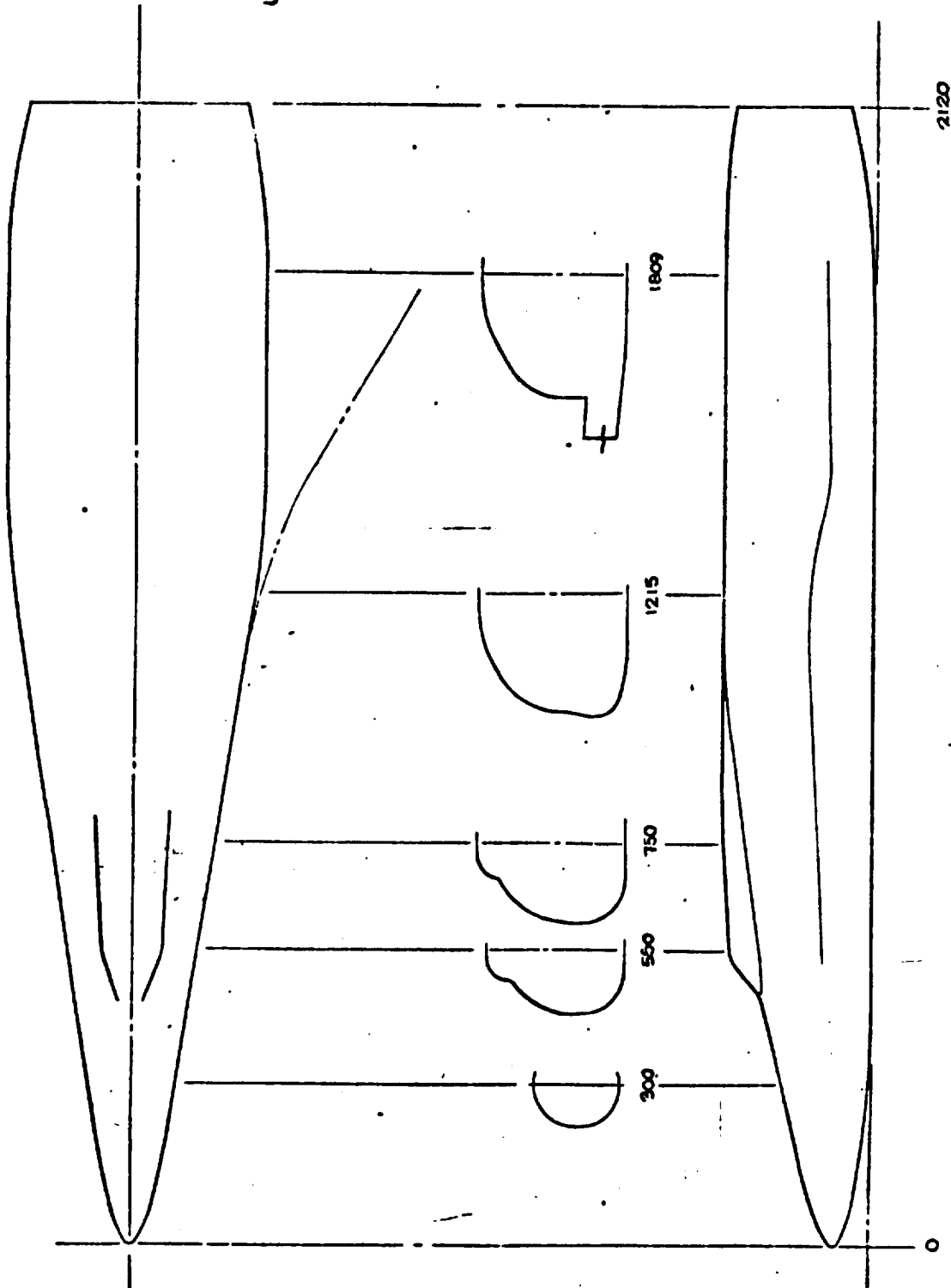


Figure 3. - BODY B5 9992-134 B CONFIGURATION

2120

DELTA WING ORBITER
NR
DR#1092 B-1- 583

685

DELTA WING ORBITER
NR
DR#1092 B-1- 684

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

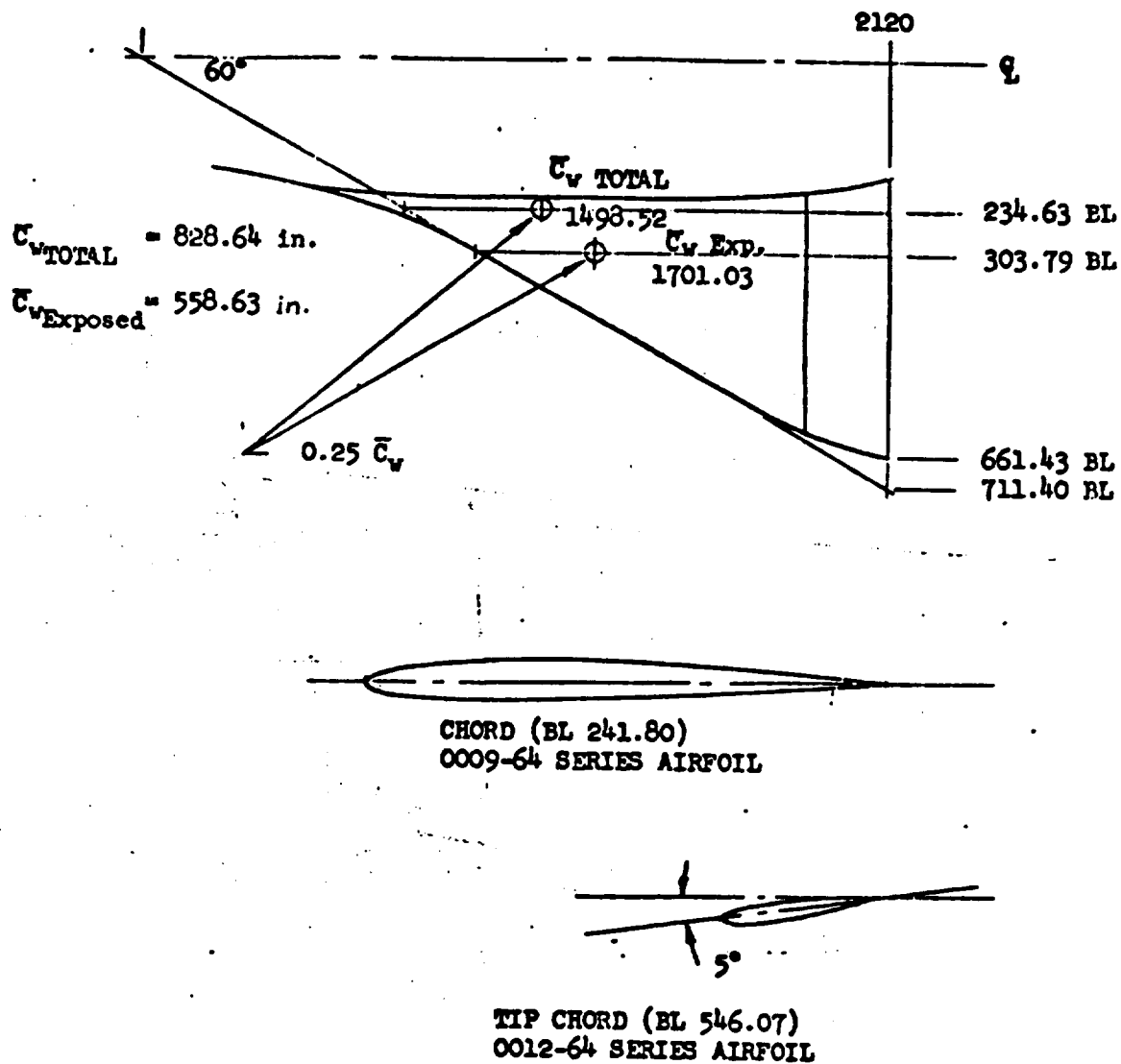


Figure 4. - WING W₁₇ 9992-134 D Configuration

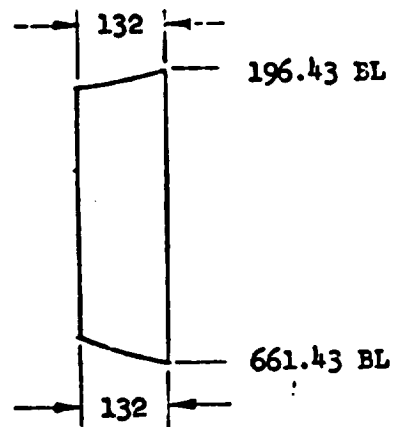


Figure 5. - ELEVON, E 10-ELEVON USED WITH WING W17

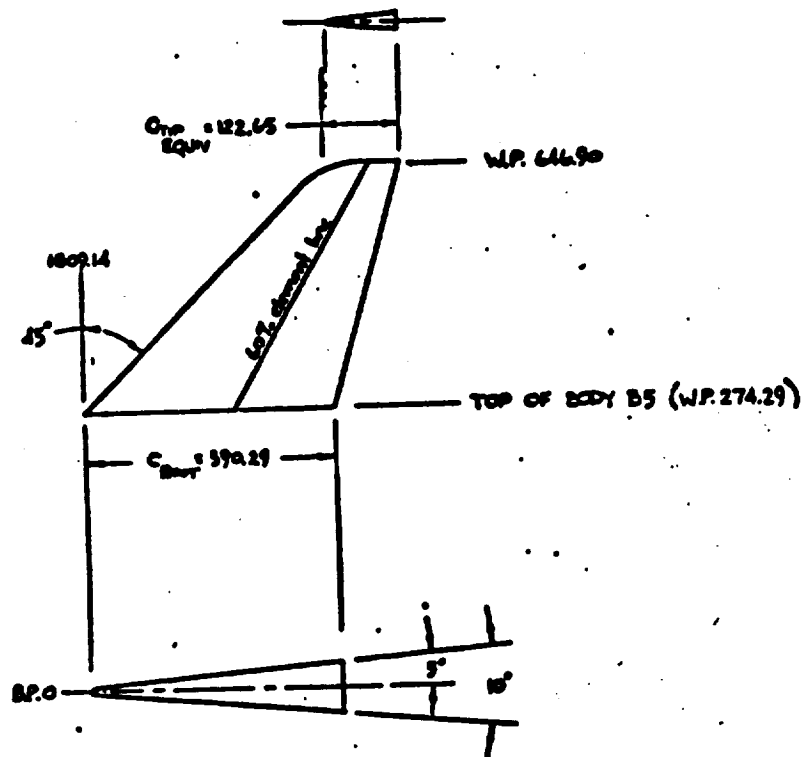


Figure 6. - Vertical Stabilizer V₁₇

ORIGINAL PAGE IS
OF POOR QUALITY

Loec
TEST 20° Mo = 6.0 DATA SET - ORGANIZATION - SHEET
-6366

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		a	B	Set	Set	Set	Set		6.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
R10001	B+Z W/E BV24	A	0	0	0	0	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

BETA Q(PSI) CN CA CLM CBL CYN CV PBZ MACH ALPHA
IDPVAR(1) IDPVAR(2) IDV

$d(A) = 0, 3, 6, 9, 12, 14, 15, 17, 22, 26, 30, 35, 40$
 $d(B) = 0, 6, 12, 14, 15, 22, 30, 35$

DELTA WING ORBITER
NR
DR#1095 B-1- 587

or
SCHEDULE

DELTA WING ORBITER
NR
DR#1095 B-1- 588

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

$X_{c.g.} = 1422.5 \text{ in. (10.854 M.S.)}$
 $Z_{c.g.} = 130.0 \text{ in. (0.992 M.S.)}$

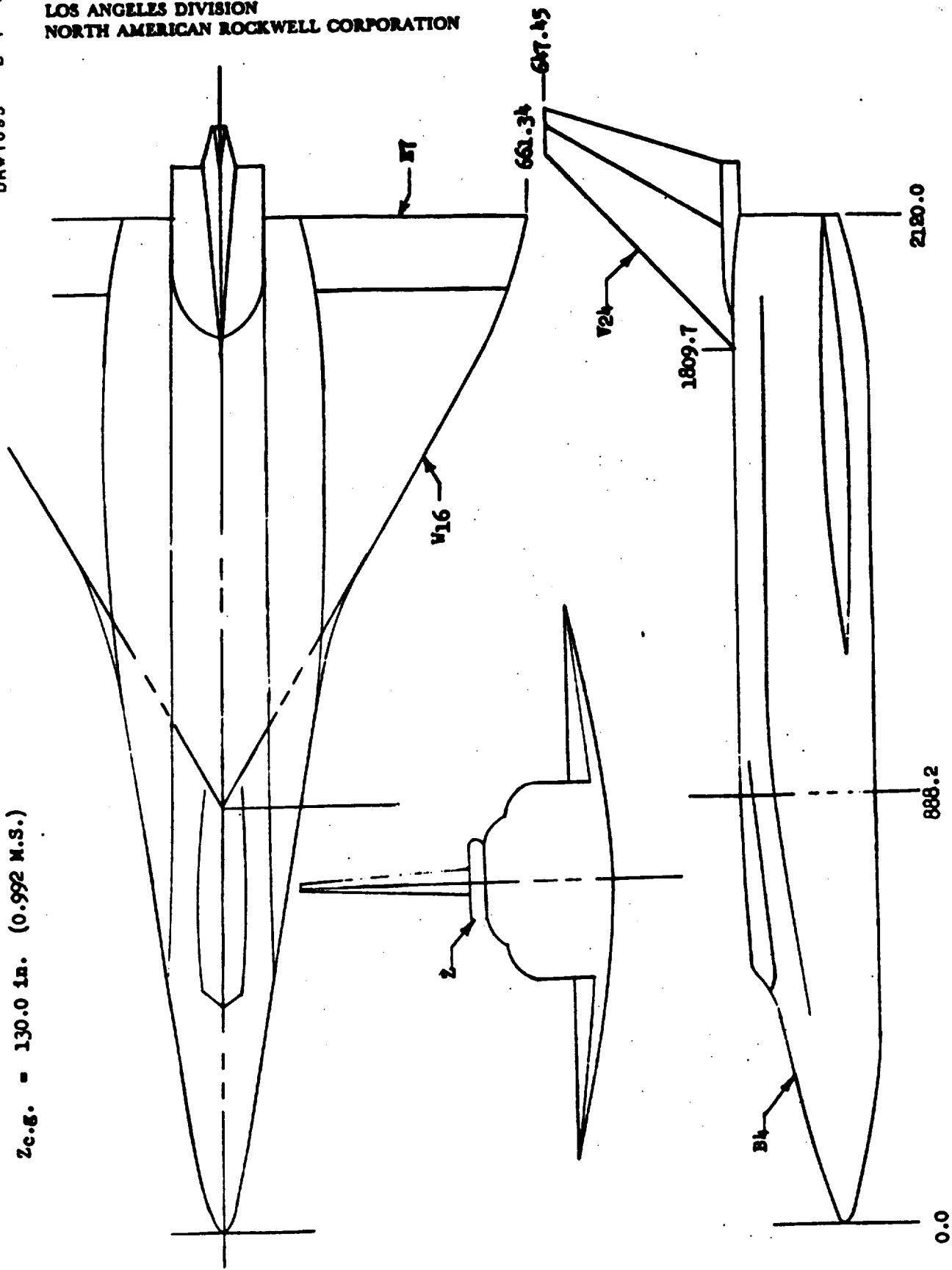
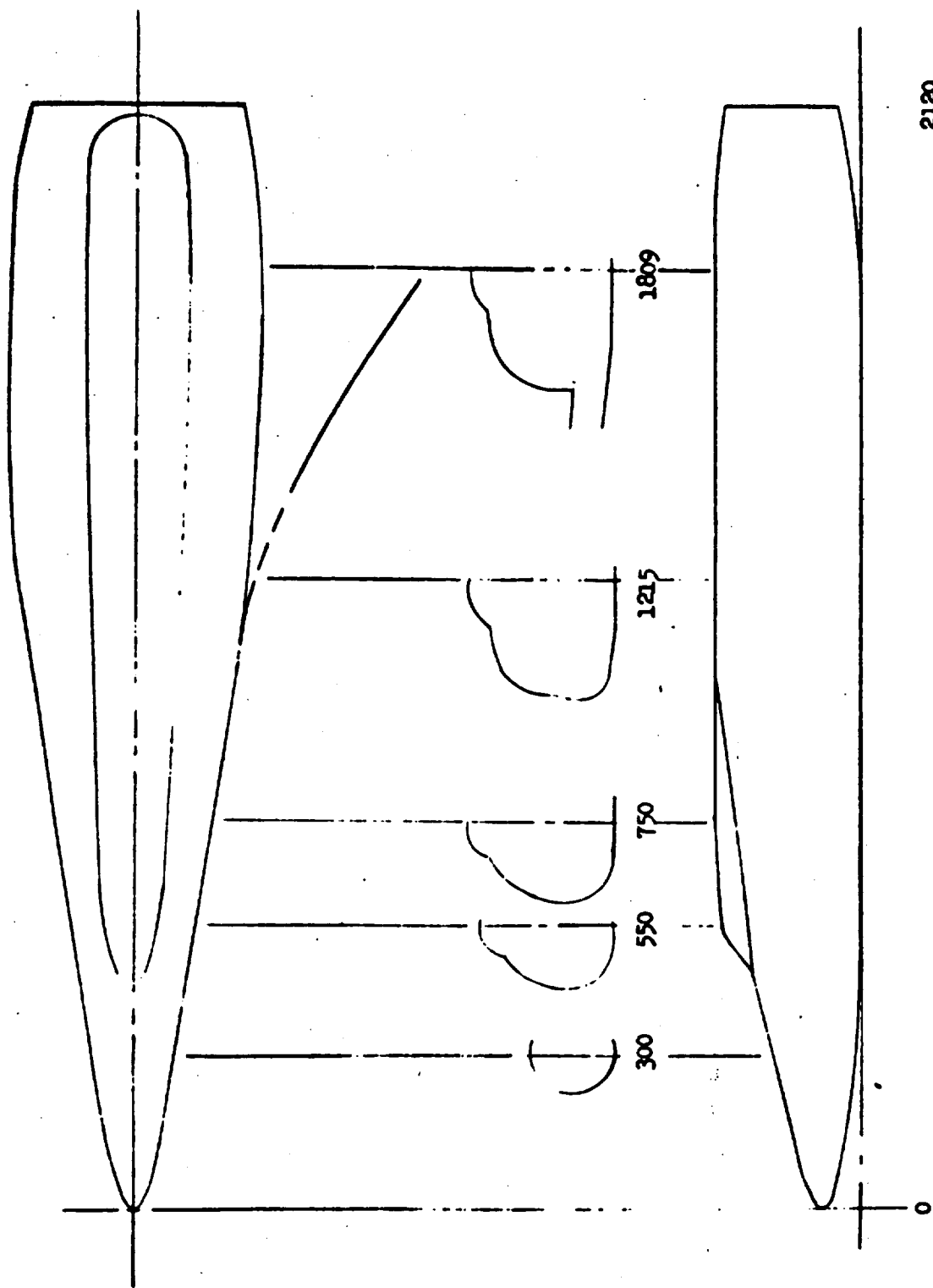


FIGURE 4. 3/4 View Sketch - Delta Wing Orbiter 690



2120
DELTA WING ORBITER
NR
DR#1095 B-1- 589

FIGURE 5. Sketch of Body, B4 - Configuration 9992-129

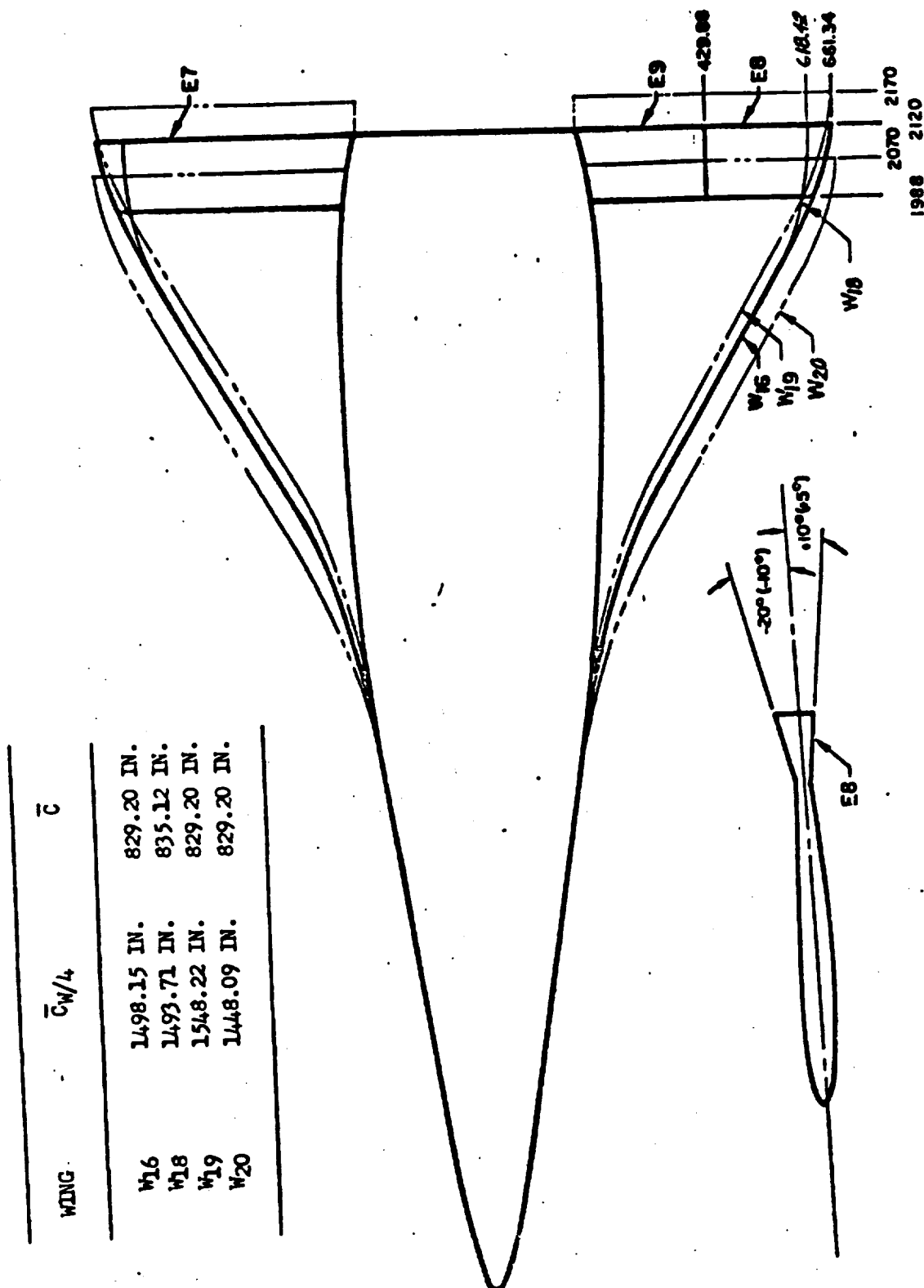


FIGURE 6. Wing and Elevon Sketches

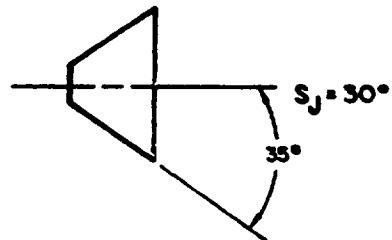
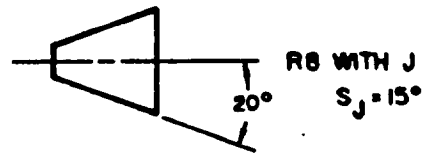
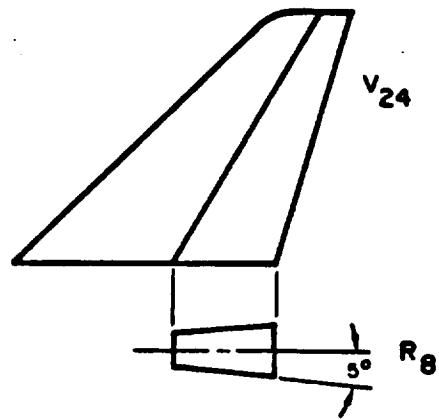
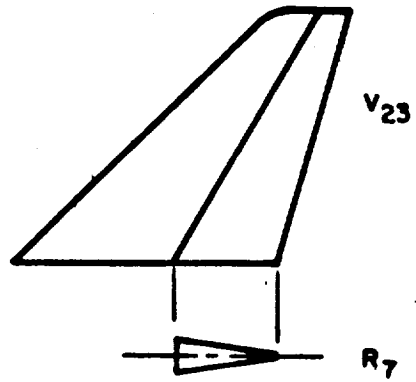


FIGURE 7. Sketches of Trailing Edges of Vertical
Tails and Rudders - Delta Wing Orbiter

ORIGINAL PAGE IS
OF POOR QUALITY

TEST LARC-UPWT 95L DATA SET COLLATION SHEET

SHEET 1 of 2

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)					
		a	B	Se	S1	Sy	Q		2.5	3.9	4.6			
RLP010	B4Z W1/6 Y24 TRA	0	B	0	0	0	0		3	9	15			
011		15	B	0	0	0	0		4	10	16			
012		30	B	0	0	0	0		5	11	17			
013		40	B	0	0	0	0		6	12	18			
001		A	0	0	0	0	0		1	7	13			
031		A	3	0	0	0	0		2	8	14			
002		C	0	0	0	0	180		19	20	21			
101	B4Z W1/6 V24 TRAY	A	0	0	0	0	0		22	24	26			
131		A	3	0	0	0	0		23	25	27			
201		A	0	0	0	0	-20		29	30	32			
231		A	3	0	0	0	-20		29	31	33			
301	B4Z W1/6 TRA	A	0	0	0	0	0		34	36	38			
351		A	5	0	0	0	0		35	37	39			
401	B4Z TRA	A	0	0	0	0	0		40	42	44			
431		A	3	0	0	0	0		41	43	45			
501	B4Z W1/6 V24 TRA	A	0	0	0	0	0		46	48	50			
531		A	3	0	0	0	0		47	49	51			
601	B4Z W1/6 V24 TRA	A	0	0	0	0	0		52	54	56			
631		A	3	0	0	0	0		53	55	57			
701	B4Z W1/6 V24 TRA J	A	0	0	30	0	0		58	60	62			

ALPHA R (PSF) ICN ICA ICLM CBL CYN ICA CAC KY
IDPVAR(1) IDPVAR(2) IDP

COEFFICIENTS: A) -4.3 -1.0, 1.2, 4.6, 9.12, 14.15, 18.20, 25.30, 35.40

B) -4.3 -1.0, 1.2, 4.6, 9.12, 14.15, 18.20, 25.30, 35.40

SCHEDULES C) -4.3 -1.0, 1.2, 4.6, 9.12, 14.15, 18.20, 25.30, 35.40

MAR 1968

Sheet 2 of 2

☐ PRETEST ☒ POSTTEST

ORIGINAL PAGE IS
OF POOR QUALITY

[illegible]

	7	19	25	31	37	43	49	55	61	67	73%
--	---	----	----	----	----	----	----	----	----	----	-----

[illegible]

969

DELTA WING ORBITER

NR

DR#1096

B-1- 594

LOS ANGELES DIVISION

NORTH AMERICAN ROCKWELL CORPORATION

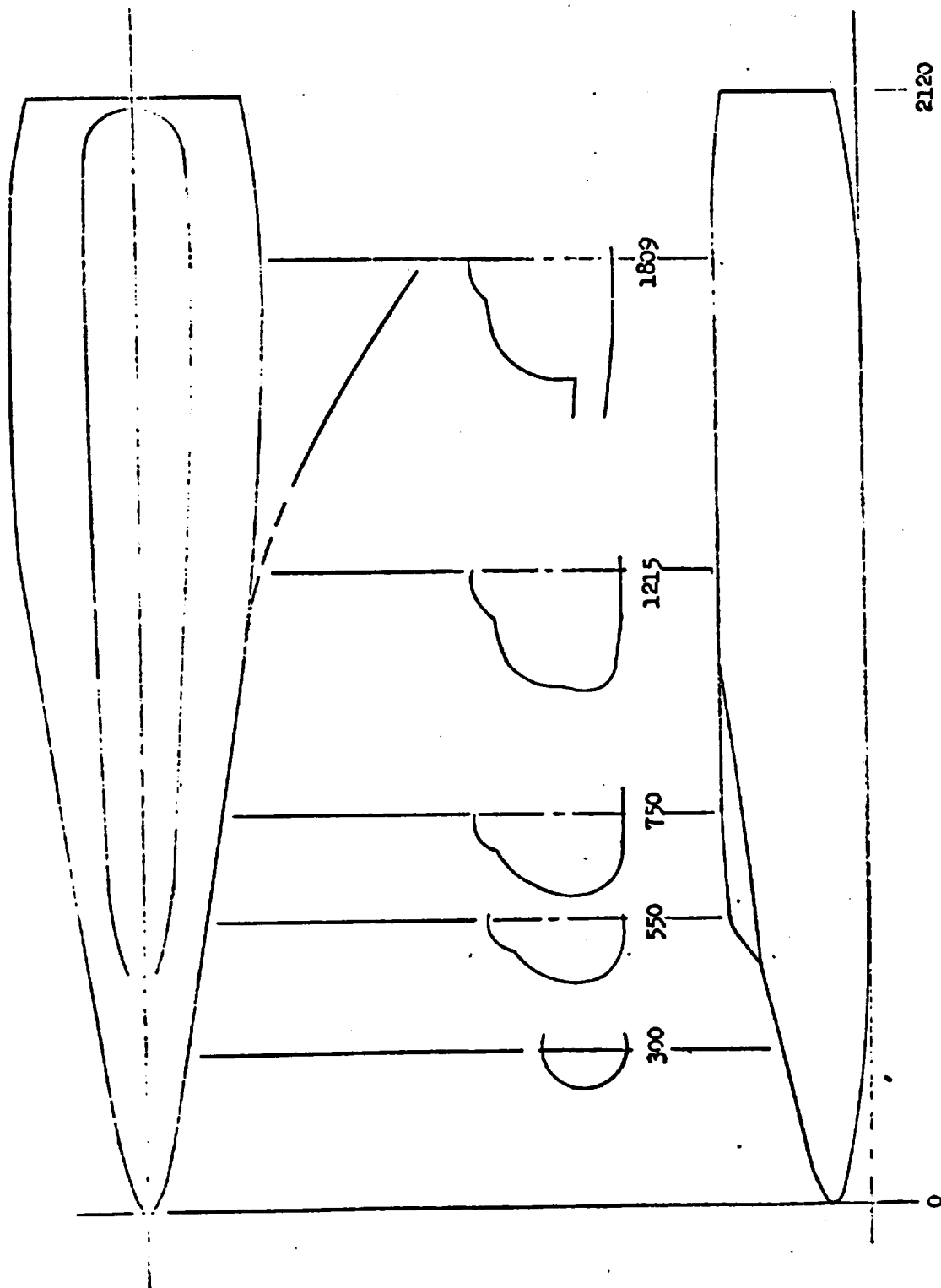


FIGURE 4. BODY B4 9992-129 CONFIGURATION

WING	F.S. $\bar{C}_{w/4}$	\bar{C}
W ₁₆	1498.15 IN.	829.20 IN.
W ₁₈	1493.71 IN.	835.12 IN.
W ₁₉	1548.22 IN.	829.20 IN.
W ₂₀	1448.09 IN.	829.20 IN.

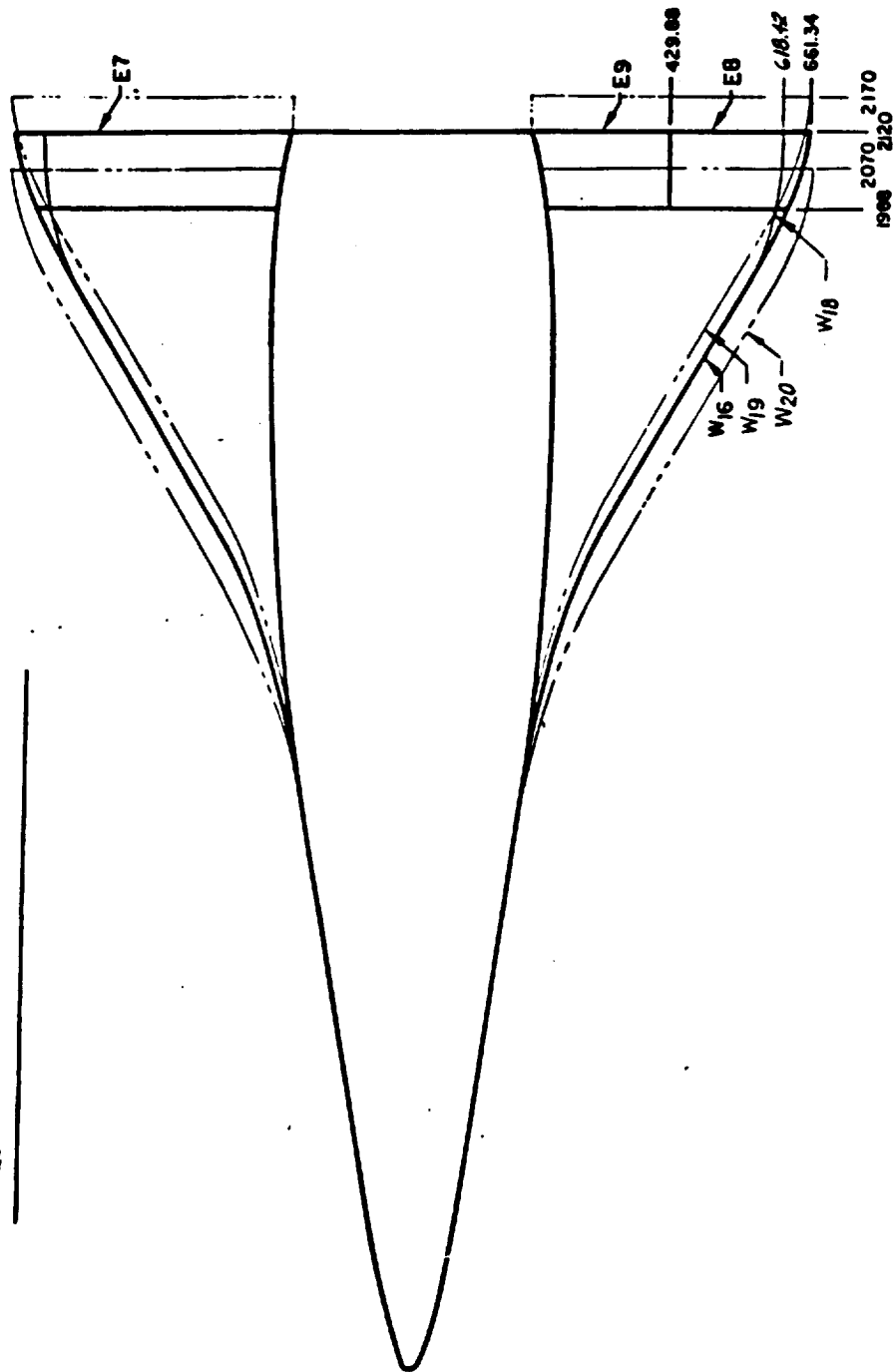


FIGURE 5. ALTERNATE WING POSITIONS

DELTA WING ORBITER
NR
DR#1096 8-1- 595

TRAILING EDGES OF VERTICAL TAILS & RUDDERS-
DELTA WING ORBITER

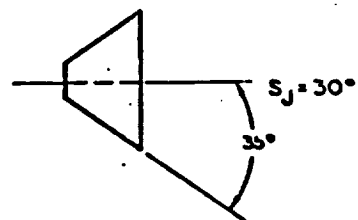
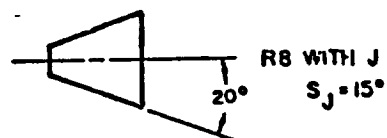
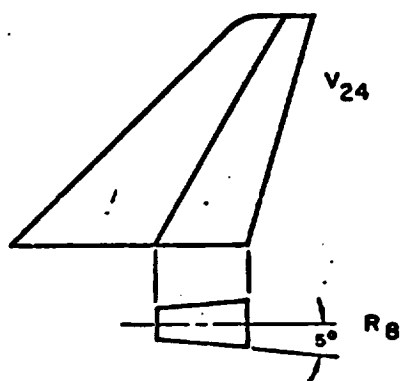
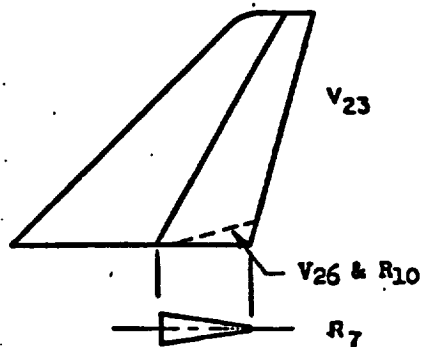


FIGURE 6. TRAILING EDGES OF VERTICAL TAILS & RUDDERS

TEST LAB-8A-574 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						
		a	b	δ_1	δ_2	δ_3	δ_4		.6	.8	.9	1.0	1.2		
R0001	BWZ V2	A	0	0	0	0	0		10	9	8	7	6		
007		5	0	0	0	0	0		40	39	38	37	36		
002		0	0	-5	-5	-5	0		15	14		12	11		
003		0	0	-15	-15	-15	0		20	19	18	17	16		
008		5	0	-15	-15	-15	0		45	44	43	42	41		
004		0	0	-30	-30	-30	0		25	24	23	22	21		
005		0	0	0	-30	-15	15		30	29	28	27	26		
009		5	0	0	-30	-15	15		50	49	48	47	46		
006	BWZ V2	0	0	0	0	0	0		35	34	33	32	31		
010		5	0	0	0	0	0		55	54	53	52	51		

7 13 19 25 31 37 43 49 55 61 67 73 75

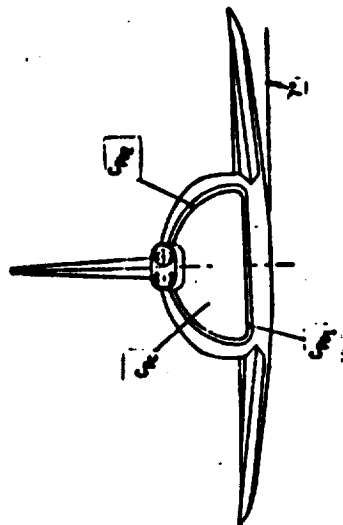
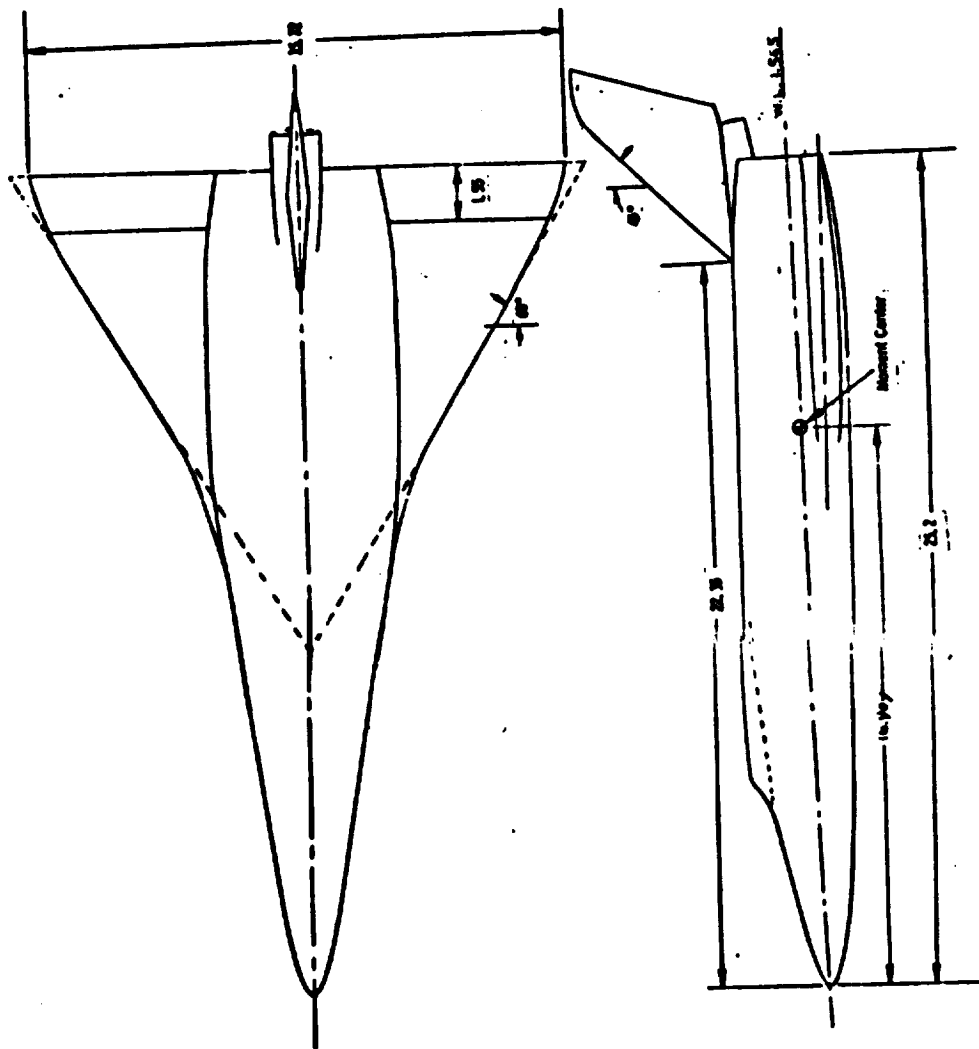
BETA 19(PSP)CN CA CLM CBL CYN CY CAP

COEFFICIENTS: A) $-2^\circ \rightarrow 20^\circ$ $4 \times 2^\circ$ IDPVAR(1) IDPVAR(2) INDY
 0 OF 8 DELTA WING ORBITER
 SCHEDULES NR
 DR#1097 B-1- 597

DELTA WING ORBITER
NR
DR#1097 B-1- 598

ORIGINAL PAGE IS
OF POOR QUALITY

Reference Dimensions
Area = 8700 Sq. Ft.
Span = 36.000 ft.
MAC = 6.700 ft.



Reference Drawing 1042 1975-1300
All dimensions are in inches.

FIGURE 2. LANGLEY 25.2" NR DELTA WING ORBITER

ORIGINAL PAGE IS
OF POOR QUALITY

COMBINED
TEST UPWT 944-961 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

* UPWT 944 - MACH No. 1.6 & 2.0
UPWT 961 - All other MACH No.

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	S ₁	S ₂	S ₃	S ₄		1.6	2.0	2.3	2.96	3.95	4.63				
RM17015	BWZ	A	0	0	0	0	0	0			50	52	54	56				
022	BWZ		5	0	0	0	0	0			51	53	55	57				
001	BWZ V ₂		0	0	0	0	0	0	14	16	2	4	6	8				
005			5	0	0	0	0	0	15	17	3	5	7	9				
010			0	-10	0	-10	-10	-10			14	15	18	20				
018			5	-10	0	-10	-10	-10			17	16	19	21				
002			0	-15	0	-15	-15	-15	9	11	26	28	22	24				
006			5	-15	0	-15	-15	-15	10	12	27	29	23	25				
012			0	-30	0	-30	-30	-30			30	32	34	36				
020			5	-30	0	-30	-30	-30			31	33	35	37				
013			0	-15	15	0	-30	-30			38	40	42	44				
021			5	-15	15	0	-30	-30			39	41	43	45				
014			0	-15	5	-10	-20	-20			46	47	48	49				
003	BWZ V ₂		0	0	0	0	0	0	1	3	58	60	62	64				
007			5	0	0	0	0	0	2	4	59	61	63	65				
004			0	-15	0	-15	-15	-15	5	7								
008			5	-15	0	-15	-15	-15	6	8								

1 7 13 19 25 31 37 43 49 55 61 67 7576
BETA 10(P.S.F.) CN CA CLM CBL CYN CY CAB IDPVAR(1) IDPVAR(2) NDV

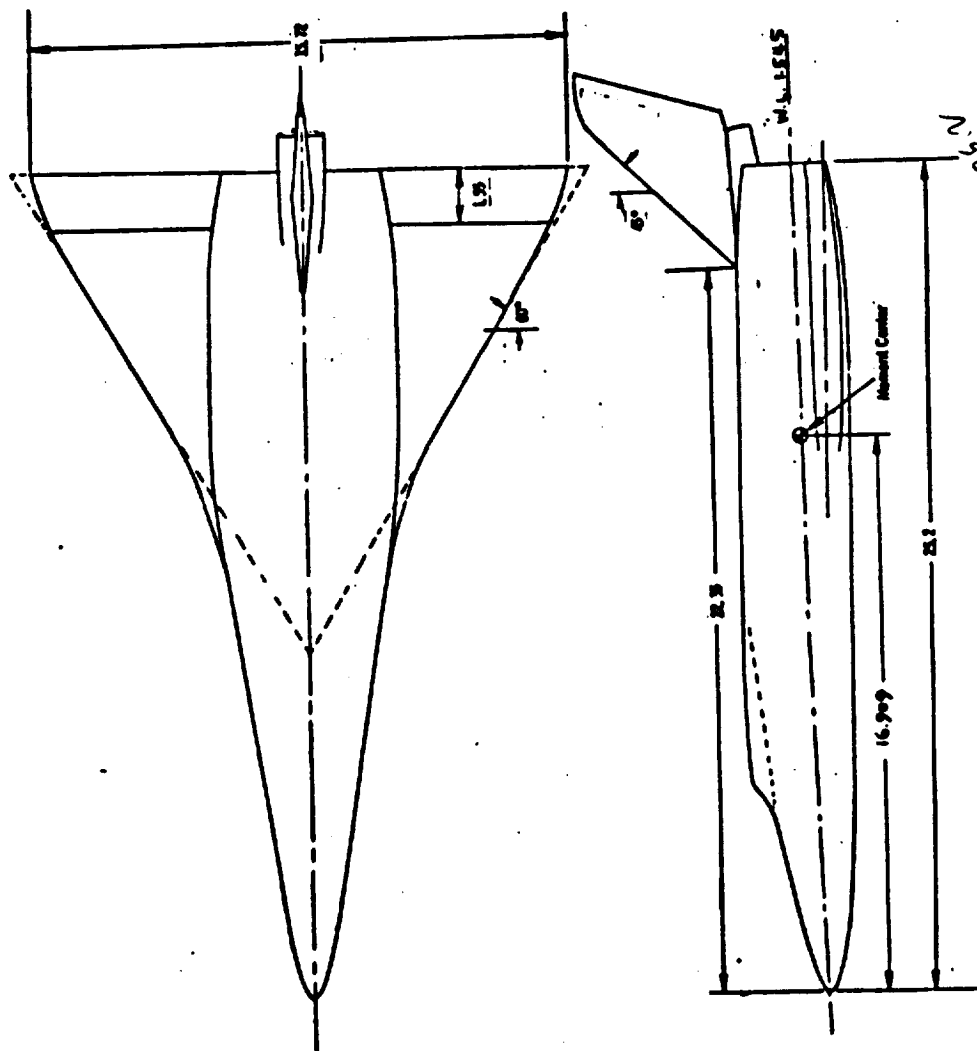
COEFFICIENTS:

a or b

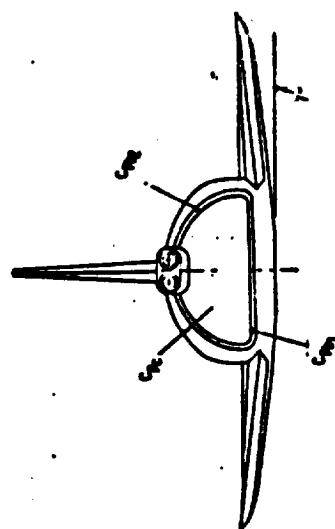
SCHEDULES

A) - 6° → 33° Δ 2° and 4°

DELTA WING ORBITER
NR
DR#1101 B-1- 599



Reference Dimensions
Area = 0.000 Sq. Ft.
Span = 26.913 in.
MAC = 0.701 in.



Reference drawing NR 1101-1100
All dimensions are in inches.

FIGURE 2. LANGLEY 25.2" NR DELTA WING ORBITER

ORIGINAL PAGE IS
OF POOR QUALITY

P6 1/2

TEST ARC 3.5-109A DATA SET COLLATION SHEET
NAR DELTA ORB. CD M=7.4

ORIGINAL PAGE IS
OF FOUR QUALITY

☐ PRETEST
☒ POSTTEST

0 = PITCH RUNS

DATA SET IDENTIFIER	CONFIGURATION	SCHD. NO.	STING BEND				0°		20°		40°	
			CONTROL DEFLECTION		α	RUN	Sched	α	RUN	Sched	α	RUN
			α	δ								
RAK001	B4W9	0	0	0	1	3	2	D	10	E	27	F
2	B4W8 V10	1	0	0	1	3	3	1	11	1	28	1
3	B4W8 V10 E4	2	-15	1	1	3	6	1	12	1	29	1
4	B4W8 V10 E4	3	15	1	1	3	7	1	13	1	30	1
5	B4W8 V10	4	0	1	1	1	3	1				
6	B4W8 V10	5	1	3	1	1	4	1				
7	B4W8 V10	6	1	8	1	1	5	1				
8	B4W9 V21	7	1	1	1	1	8	1				
9	B4W9 V22	8	1	1	1	1	9	1				

COEFFICIENTS:
 $D(\alpha) = 0 \ 2 \ 4 \ 6 \ 8 \ 10 \ 12 \ 14 \ 16 \ 18$
 $E(\alpha) = 20^\circ + D(\alpha) = 20 \ 22 \ 24 \ 26 \ 28 \ 30 \ 32 \ 34 \ 36 \ 38$
 $F(\alpha) = 40^\circ + D(\alpha) = 40 \ 42 \ 44 \ 46 \ 48 \ 50 \ 52 \ 54 \ 56 \ 58$

SCHEDULES
 CN CA CLM CM CYN CBL L/D CAB
 1 7 13 19 25 31 37 43 49 55 61 67 7576
 MICH ALP114 8
 IDPVAR(1) IDPVAR(2) IDV

DELTA WING ORBITER
NR
DR#1104 B-1- 601

Page 2

TEST ARC 3.5-109A DATA SET COLLATION SHEET
NAR DELTA ORB @ M=7.4

☐ PRETEST
☒ POSTTEST

1 = SIDESLIP RUNS

DATA SET IDENTIFIER	STING LEAD CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	STING BEND \angle				MACH NUMBERS	
		a	b	del	der	Rey	0°	15°	30°	45°		
RAK1B0	B4W9	15	P	0	0	1		15				
	CO	30							20			
	DO	45								26		
A1	B4W9V21	0					22					
B1		15						17				
A2	B4W9V22	0					21					
B2		15						18				
B3	B4W8V10	15						14				
C3		30							19			
D3		45								23		
D4	B4W8V10E4	45								24		
D5		45								25		

1 7 13 19 25 31 37 43 49 55 61 67 73.76

CN CA CLM CY ICYN CBL L/D CAB MACH ALPHA 8

COEFFICIENTS: $\beta(P) = 0, 2, 4, 6, 8, 10, 12, 14, 16$

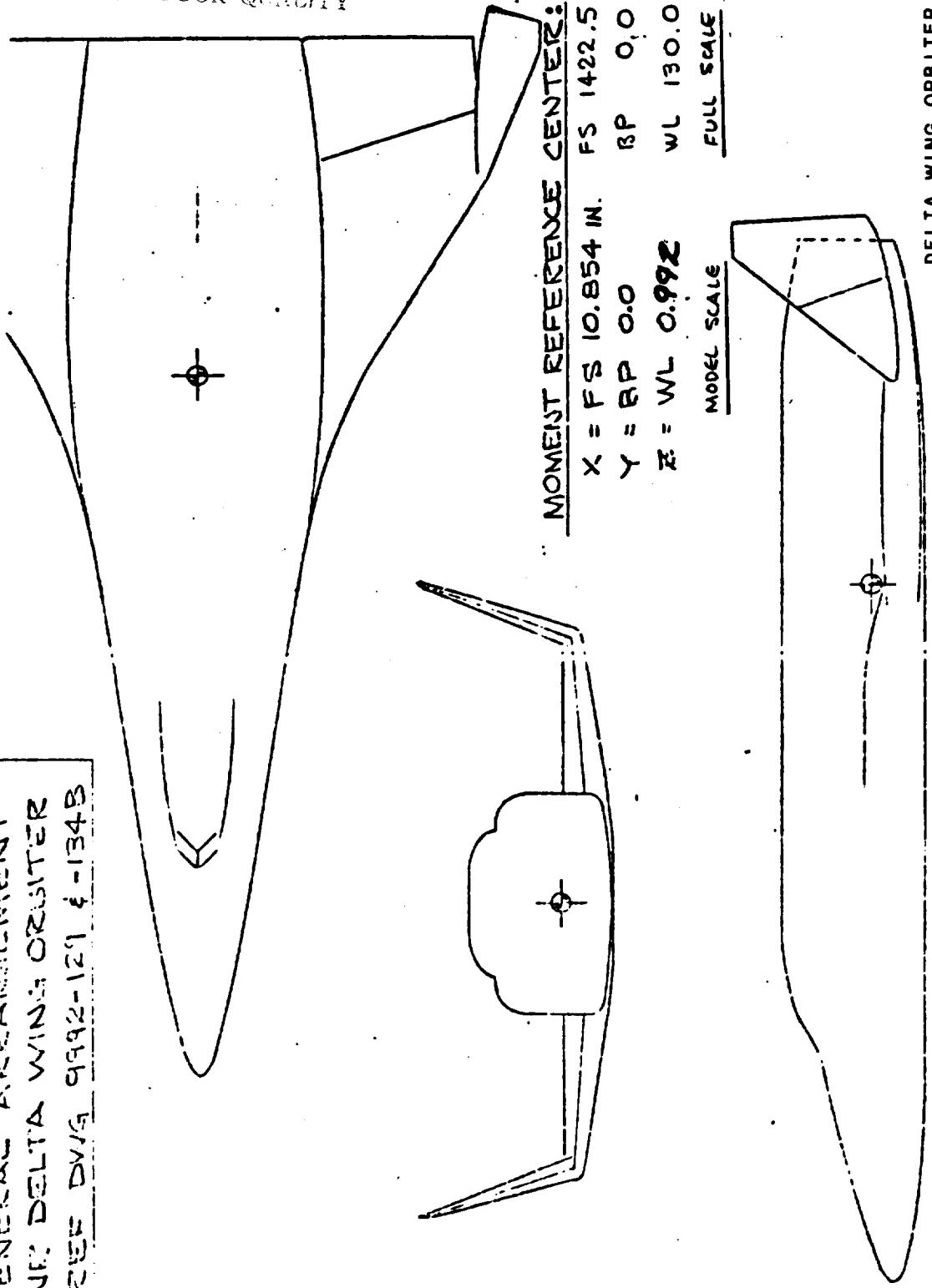
SCHEDULES

INDV INDV (1) INDV (2) INDV

704

GENERAL ARRANGEMENT
 NR DELTA WING ORBITER
 REF DWG 9992-121 & -134B

ORIGINAL PAGE IS
 OF POOR QUALITY



MOMENT REFERENCE CENTER:
 X = FS 10.854 IN. FS 1422.5 IN.
 Y = BP 0.0 BP 0.0
 Z = WL 0.992 WL 130.0
 MODEL SCALE FULL SCALE

DELTA WING ORBITER
 NR

Figure 5. General Arrangement of NR Clipped Delta Wing Orbiter DR#1104 B-1- 603

DELTA WING ORBITER
MODEL SCALE 0.00763

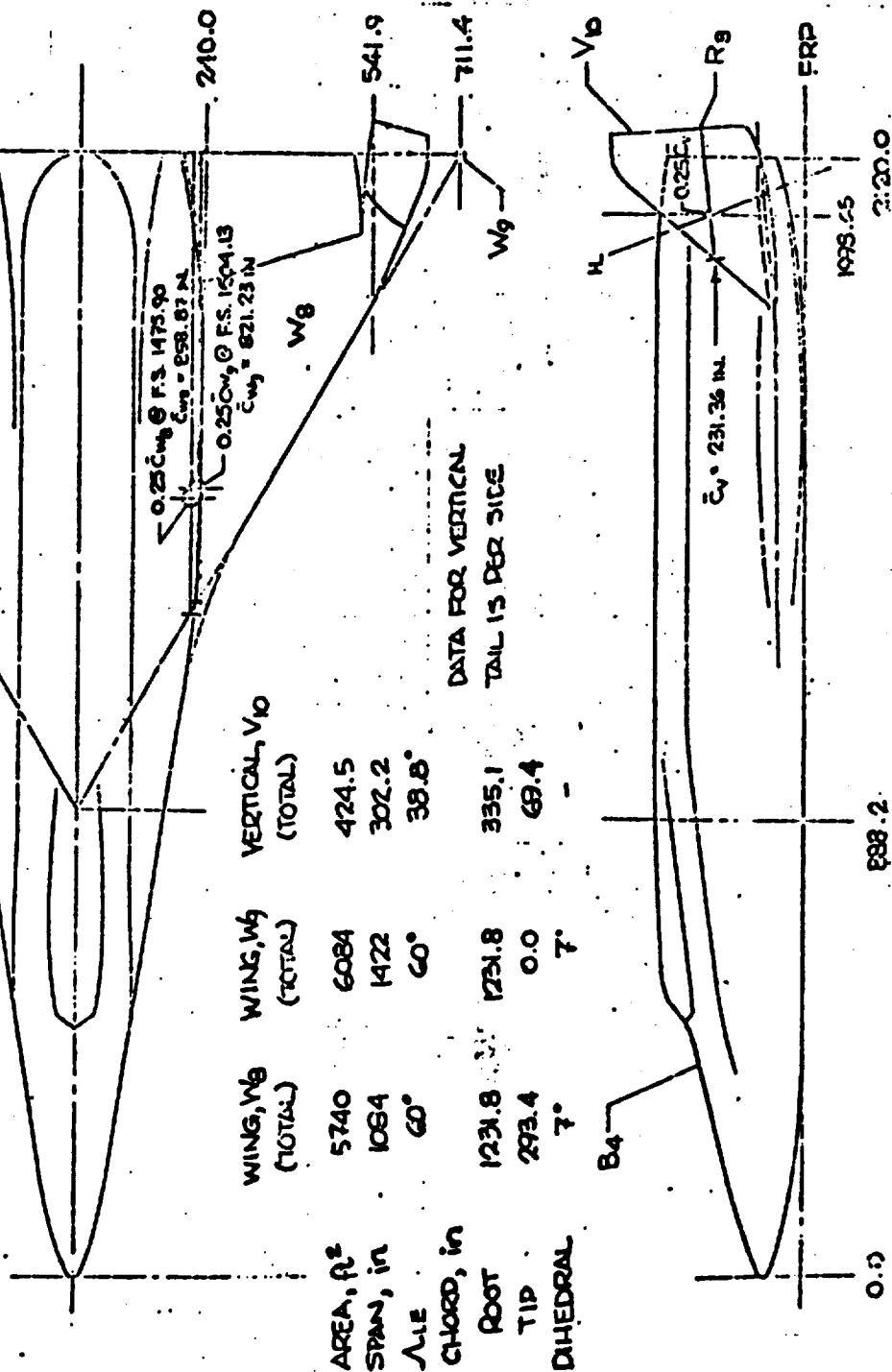


Figure 6. NR Delta Wing Orbiter - Two View

TEST 4. R. 851-573 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
			a	b	c	d		e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
R4001	R4ZW16V2L1729	A	0	0	0	0	5	5	4	3	2	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

BETA, Q(PSE), CN, CA, CLM, CBL, CYN, CY, CAB, MACH, ALPHA

COEFFICIENTS: $a(1) = -2.22, 4.98, 10.18, 14.18, 22.22, 26.26, \text{MAX}$

or 1
SCHEDULES

DATE: JAN 20 1968

DELTA WING ORBITER
NR
DR#1105 B-1- 605

DELTA WING ORBITER
NR
DR#1105 B-1- 606

TEST 6268 F573 DATA SET/RUN NUMBER
COLLATION SUMMARY

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIED	CONFIGURATION	SCID.	PARAMETERS/VALUES			NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)							TEST RUN NUMBERS									
			3	4	5	6	7	8	9	10	11	12	13										
R10021	BVZW19 TR9	A	0	0	0	0	0	0	0	0	0	0	0	107	106	105	104	103					
T022	Bd 2 TR9	T	S	—	—	—	—	—	—	—	—	—	—	111	110	109	108	107					
023	BVZW16 TR9	T	T	0	—	—	—	—	—	—	—	—	—	117	116	115	114	113					
024	BVZW16 V24 TR9	T	T	0	0	0	0	0	0	0	0	0	0	122	121	120	119	118					
025	BVZW16 V24 TR9	T	T	15	15	15	15	15	15	15	15	15	15	127	126	125	124	123					
026	BVZW16 V24 TR9	T	S	30	30	30	30	30	30	30	30	30	30	132	131	130	129	128					
210027	BVZW16 V24	A	0	0	0	0	0	0	0	0	0	0	0	137	136	135	134	133					

7 11 19 25 31 37 43 49 55 61 67 73 79

COEFFICIENTS: Q10 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

a or b

SCHEDULES

NASA-WFPC-MAP

TEST	DATA SET/RUN NUMBER	COLLATION SUMMARY
------	---------------------	-------------------

LARC-573 AND AMES-548 COMBINED DATA

COEFFICIENTS:

$a(P)$	-2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	Max.
$a(R)$	-2	0	2	4	6	8	10	12	14	16	18	20	22	24		

DELTA WING ORBITER
NR
DR#1105 B-1- 607

$X_{c.g.} = 1422.5 \text{ in. (10.854 M.S.)}$

$Z_{c.g.} = 130.0 \text{ in. (0.992 M.S.)}$

DELTA WING ORBITER
NR
DR#1105 B-1- 608

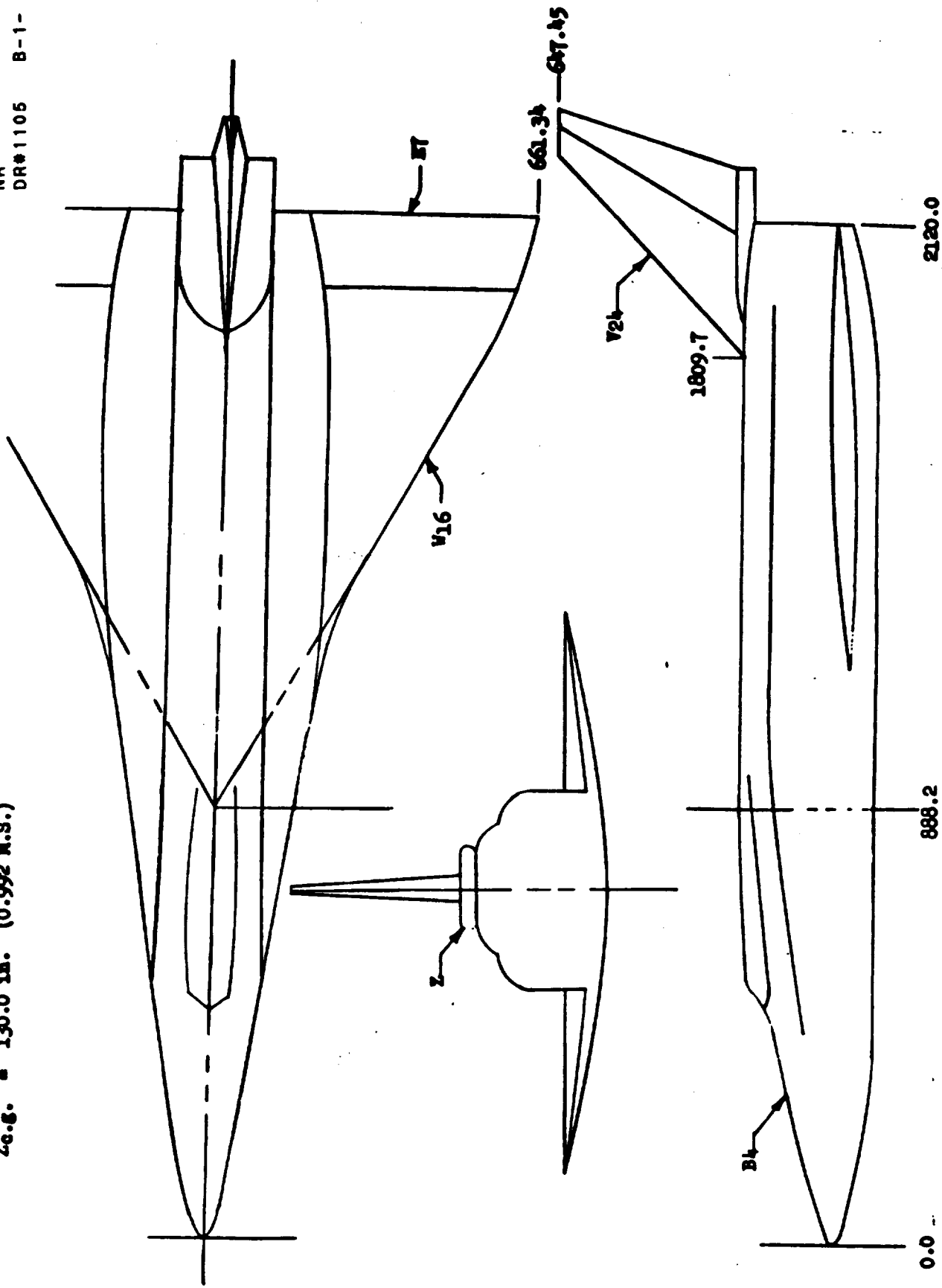


FIGURE 2. THREE VIEW SKETCH-DELTA WING ORBITER

WING	$\bar{C}_{W/4}$	\bar{C}
W ₁₆	1498.15 IN.	829.20 IN.
W ₁₈	1493.71 IN.	835.12 IN.
W ₁₉	1548.22 IN.	829.20 IN.
W ₂₀	1448.09 IN.	829.20 IN.

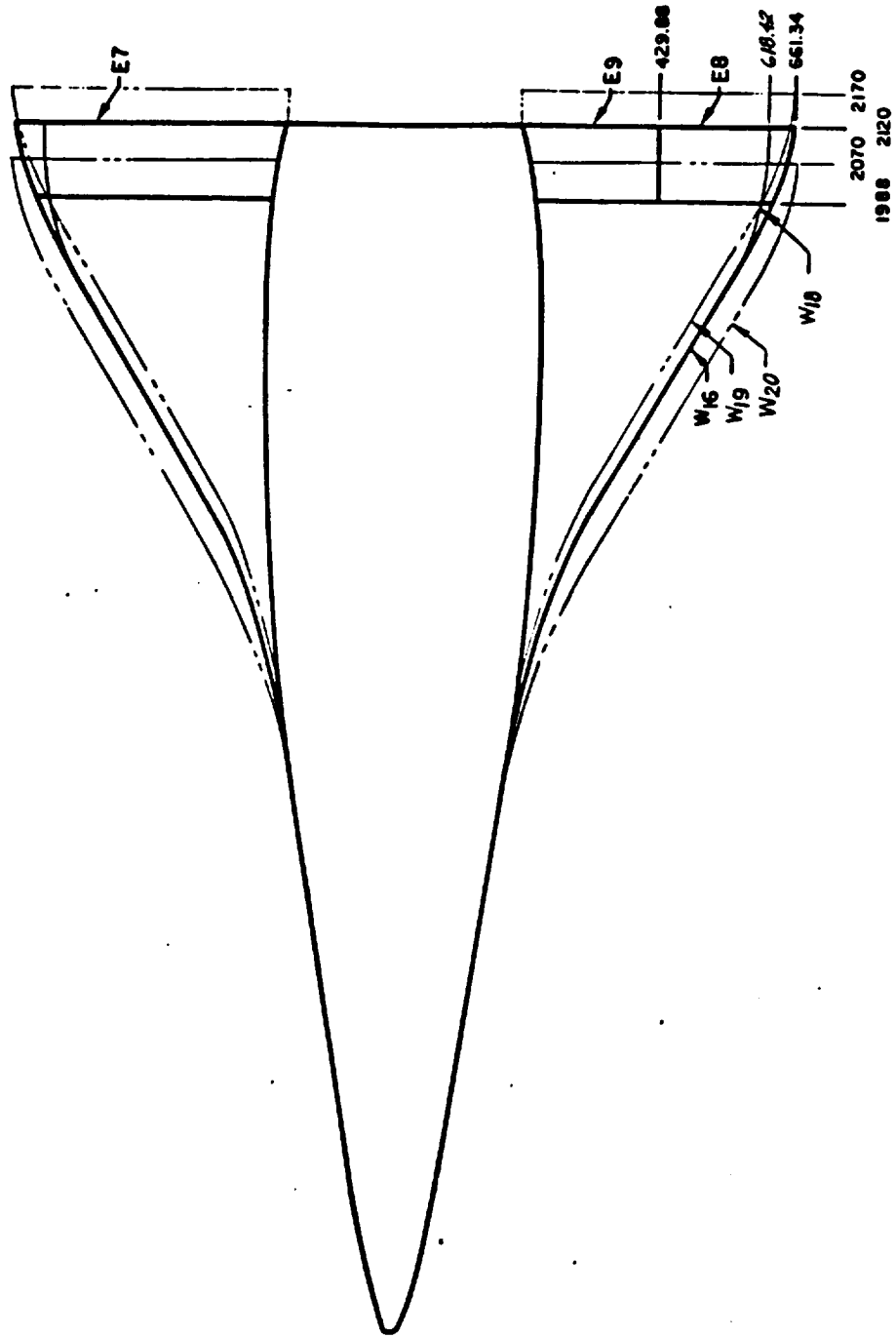


FIGURE 3. ALTERNATE WING POSITIONS

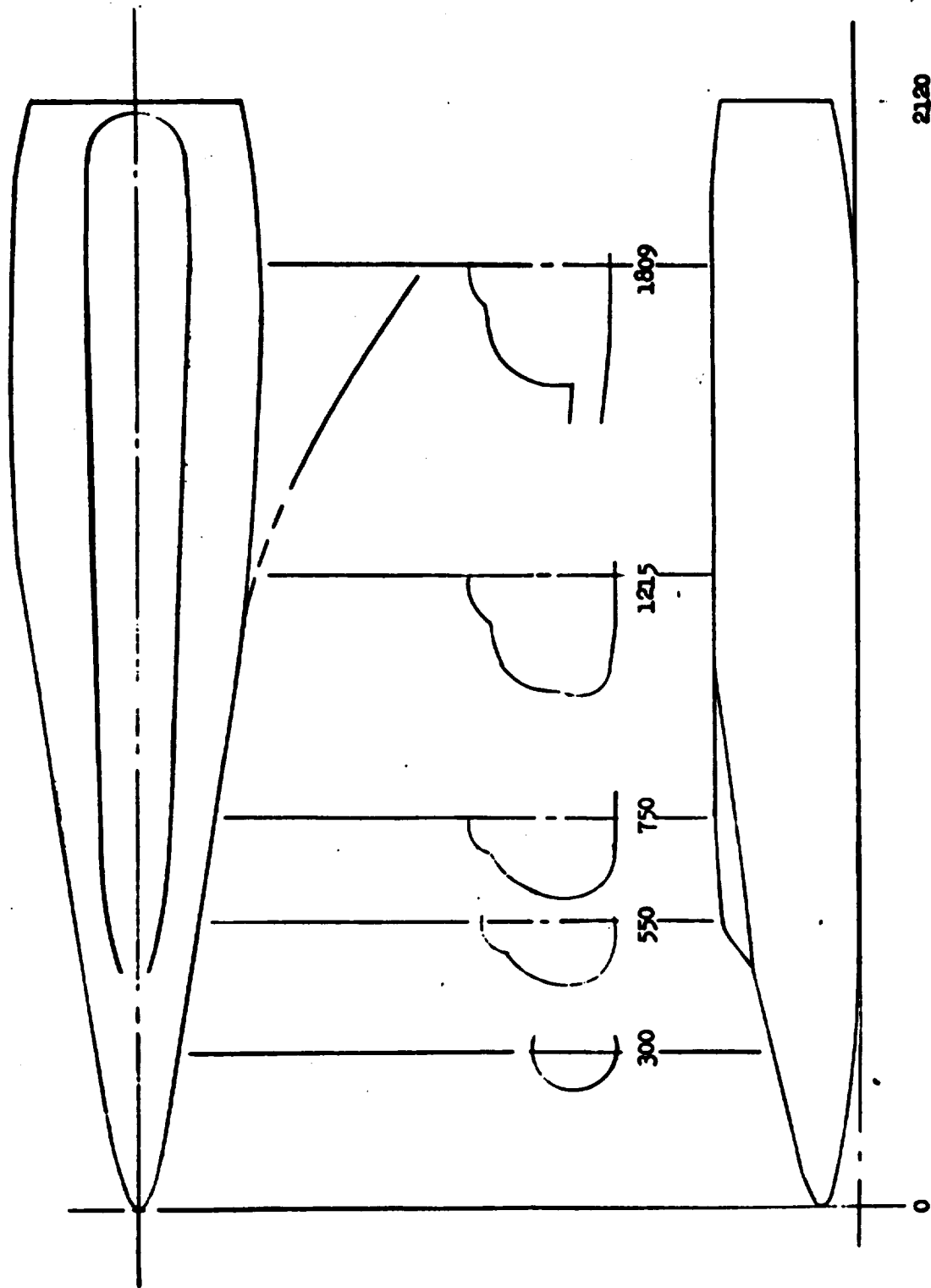
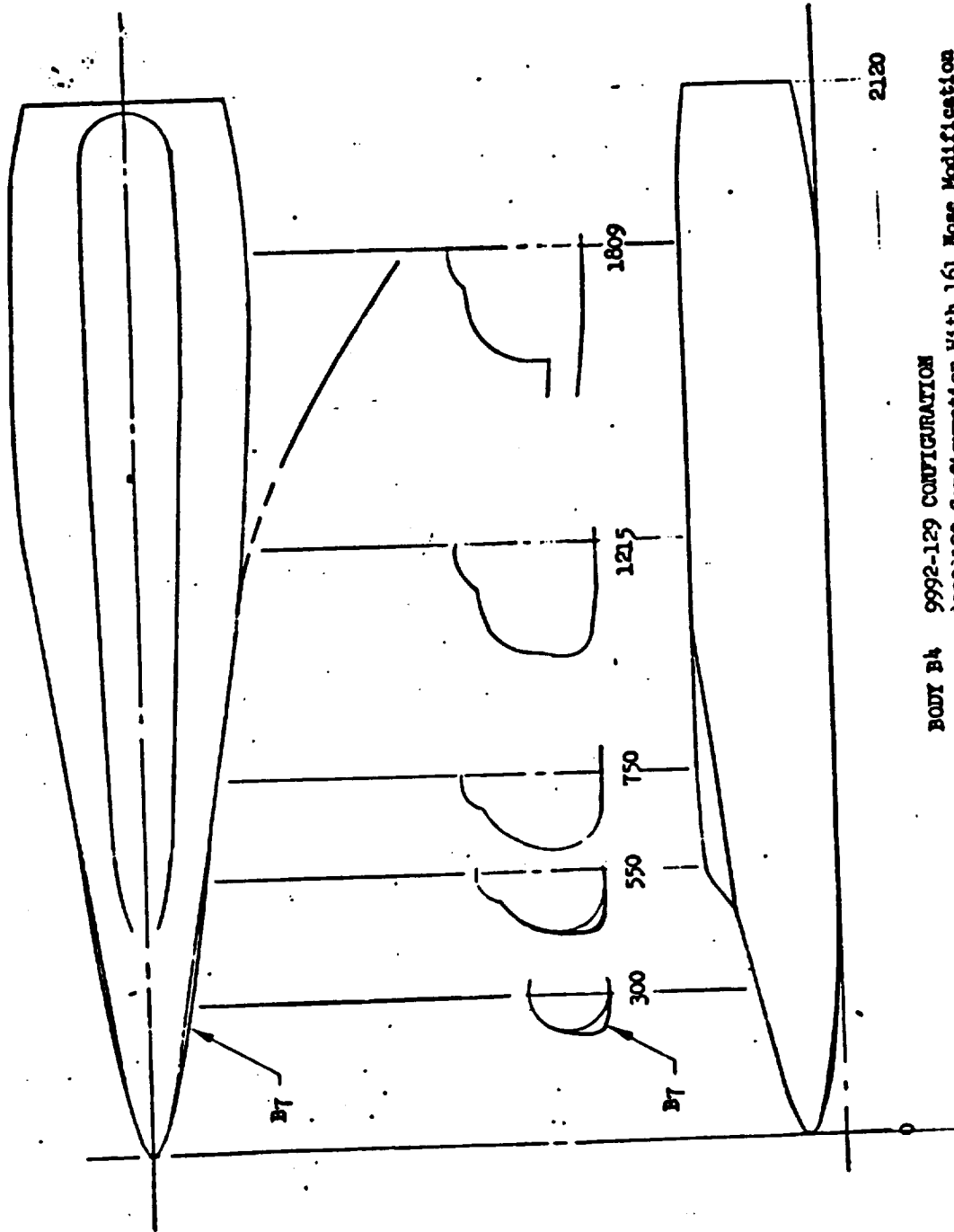


FIGURE 4. BODY B4 9992-129 CONFIGURATION



BODY B4 9992-129 CONFIGURATION
 Body B7 9992-129 Configuration With 161 Nose Modification

WING B-100 Reconfigured R. Body

DELTA WING ORBITER
 NR
 DR#1105 B-1- 611

TRAILING EDGES OF VERTICAL TAILS & RUDDERS- DELTA WING ORBITER

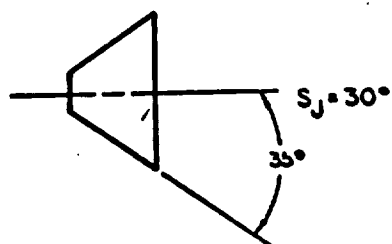
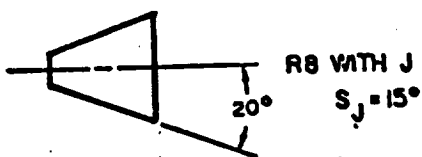
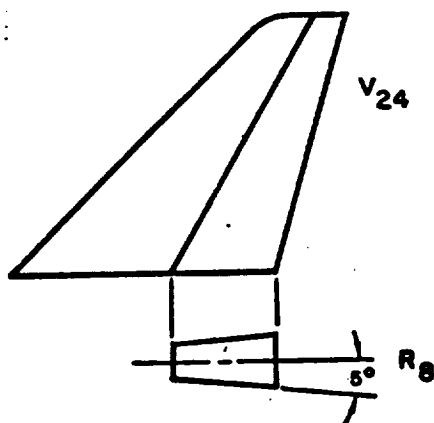
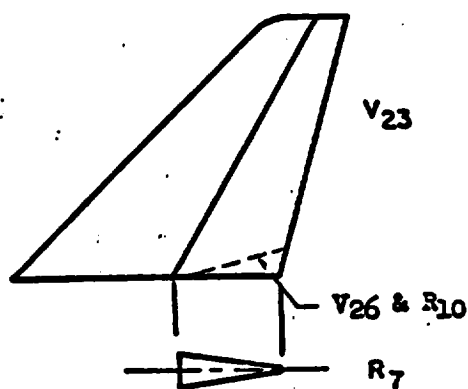


FIGURE 5. TRAILING EDGES OF VERTICAL TAILS AND RUDDERS

TEST LRC LIPT-57 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	FEET NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										RN/L
		A	B	δ_5	δ_2	δ_1	δ_0		2.5	4.0	6.0	8.0	10.0	12.0	14.0				
RLN001	B4Z W16 V26	A	0	0	0	0	0	2120	1	2	3	4	5	6	7				
02	B4Z W16 V26 E7																		
03																			
04																			
05	B4Z W16 V26 E6																		
06																			
07																			
08	B4Z W16 V26	C																	
09	B4Z W16 V26 E7	B																	
10																			
11																			
12	B4Z W9 V26																		
13	B4Z W18 V26																		
14	B4Z W19 V26																		
15	B4Z W16																		
16																			
17	B4Z W16 V26																		
18		A																	
19	B4Z W16																		
20																			
		7	13	19	25	31	37	43	49	55	61	67	73	79	85				
		BETA Q(PSF) CN CA CLM CBL CYN CY CAF CAB RN/L																	
		IDPVAR(1) IDPVAR(2) IDV																	

COEFFICIENTS:

A) -1, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

B) 16, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41

C) 24, 22, 20, 18, 16, 14, 12, 10, 8, 6, 4, 2, 0, -1

a or b

SCHEDULES

DELTA WING ORBITER
 NR
 DR#1106 B-1- 613

DELTA WING ORBITER
NR
DR#1106 B-1- 614

TEST L2RC LTP1-57 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. of RIMS	POWER NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										RN/L	POSTTEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		a	b	Σc	ΣR	Wint		2.5	4.0	6.0	8.0	10.0	12.0	14.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
RLN021	B4Z W16 V16 R16	A	0	0	-10	2120				84	85	86																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

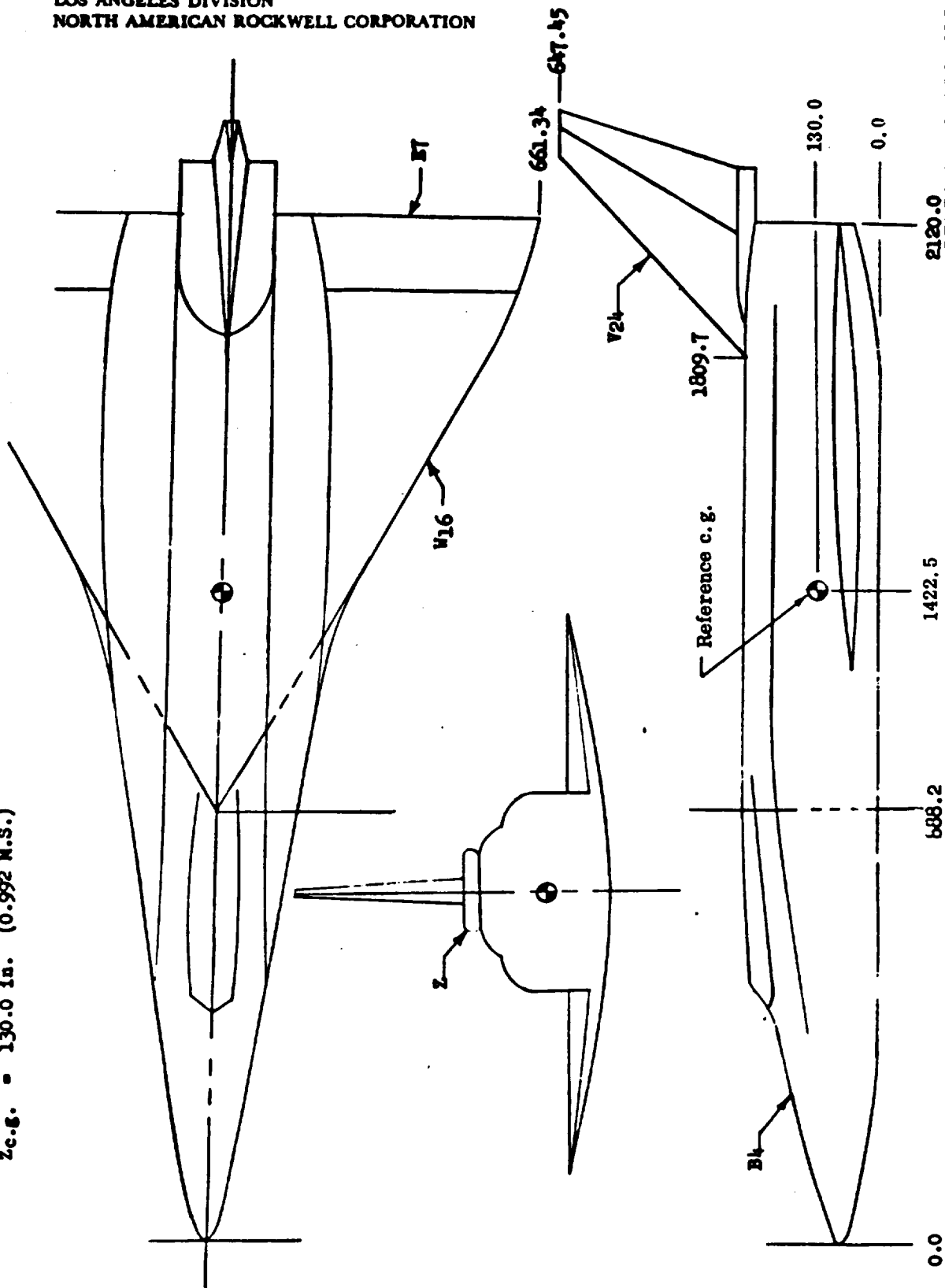
BETA 10(PSE)CN CA CLM COL SYN CY CAF CAB RUL
COEFFICIENTS:
A) -1.0, 2.4, 6.4, 10.12, 14.16, 18.20, 22.24
SCHEDULES

NASA-MSPC-MAP

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

$X_{c.g.} = 1422.5 \text{ in. (10.854 M.S.)}$

$Z_{c.g.} = 130.0 \text{ in. (0.992 M.S.)}$



2120.0
DELTA WING ORBITER
NR
DR#1106 B-1- 615

FIGURE 4. 3 VIEW SKETCH-DELTA WING ORBITER

DELTA WING ORBITER
NR
DR#1106 B-1- 616

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

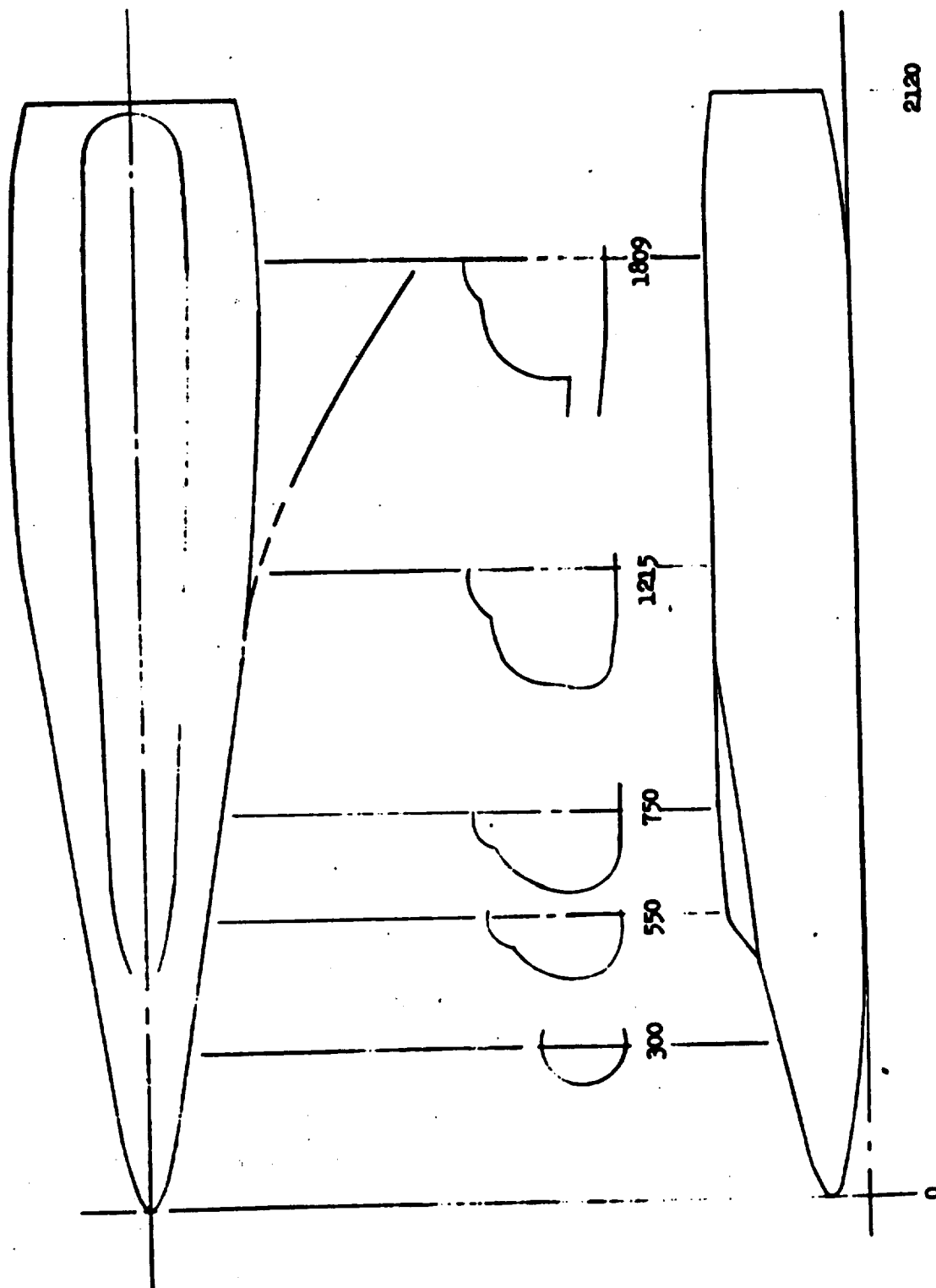
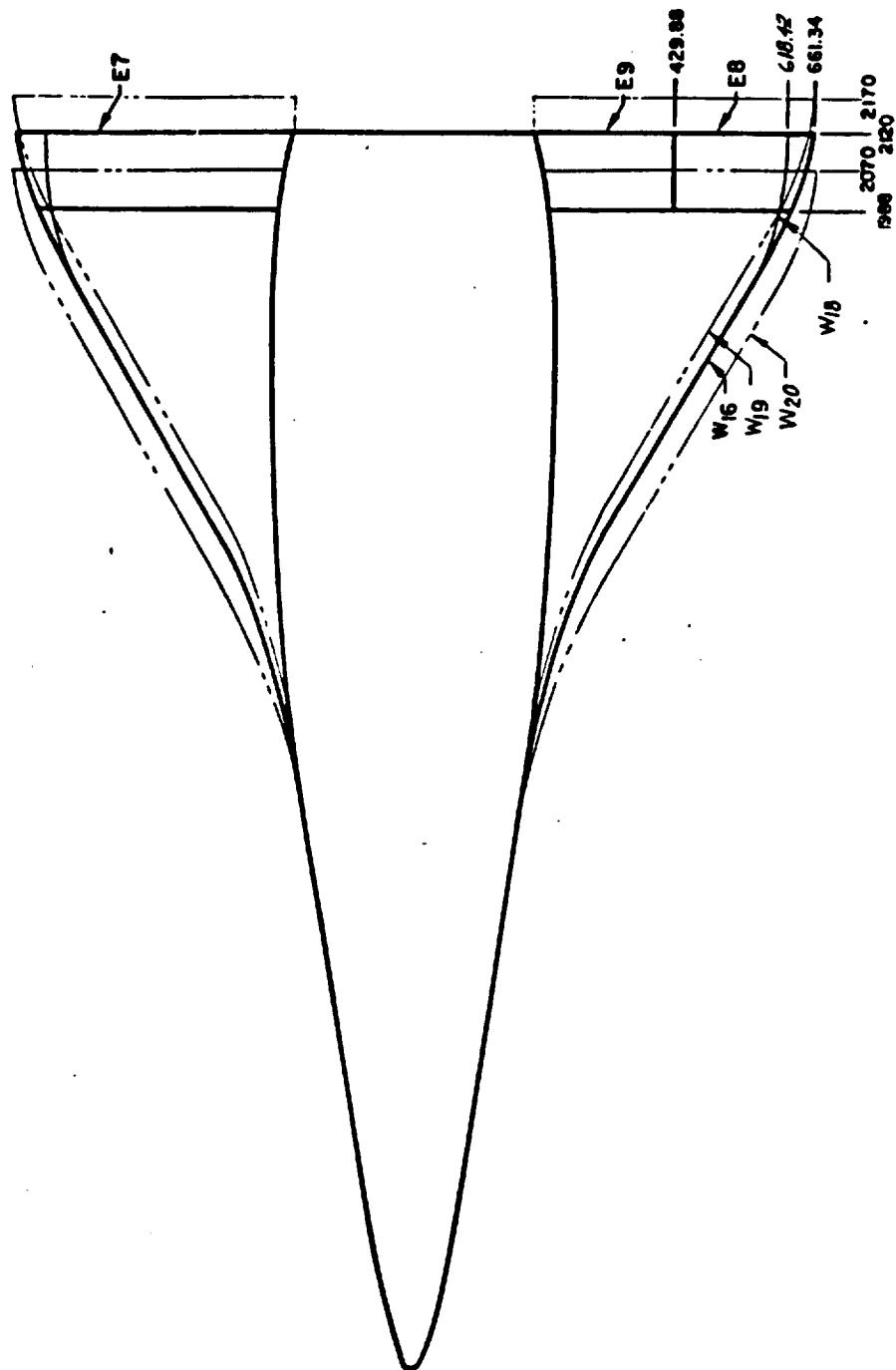


FIGURE 5. BODY B4 9992-129 CONFIGURATION

WING	F.S. $\bar{C}_w/4$	\bar{C}
W16	1498.15 IN.	829.20 IN.
W18	1493.71 IN.	835.12 IN.
W19	1548.22 IN.	829.20 IN.
W20	1448.09 IN.	829.20 IN.



DELTA WING ORBITER
NR
DR#1106 B-1- 617

FIGURE 6. ALTERNATE WING POSITIONS

DELTA WING ORBITER
NR
DR#1106 B-1- 618

TRAILING EDGES OF VERTICAL TAILS & RUDDERS- DELTA WING ORBITER

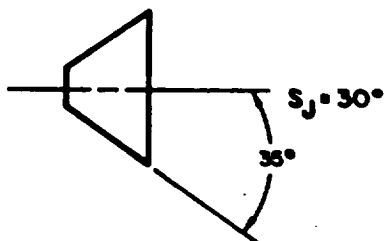
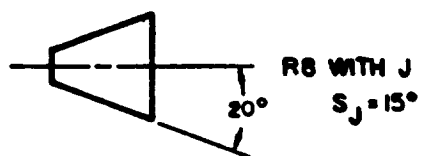
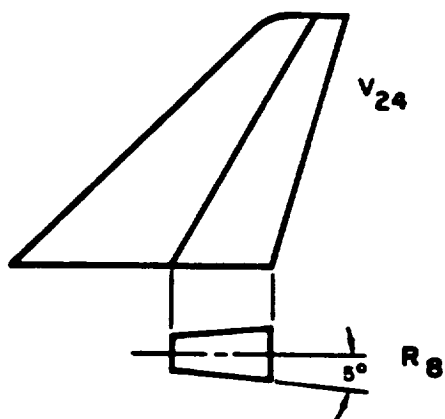
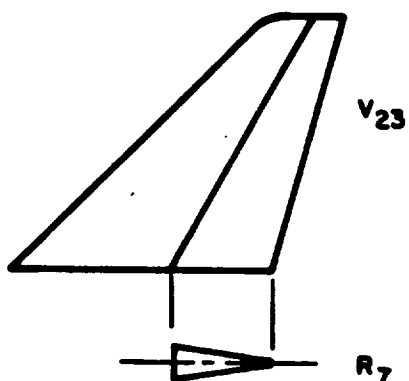


FIGURE 7. TRAILING EDGES OF VERTICAL TAILS & RUDDERS

TEST LARC-LTPI 58 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER		CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	RW/L										ALTERNATE INDEPENDENT VARIABLE										PK POSTTEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
			a	b	delta	delta	delta	delta		delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta		delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta	delta

1 7 13 19 25 31 37 43 49 55 61 67 7576
 BETA Q(PSF)CH CA CLM CBL CYN CY CPB CPC RN/L
 COEFFICIENTS: IDPVAR(1) IDPVAR(2) IDPVAR(3) IDPVAR(4) IDPVAR(5) IDPVAR(6) IDPVAR(7) IDPVAR(8) IDPVAR(9) IDPVAR(10) IDPVAR(11) IDPVAR(12) IDPVAR(13) IDPVAR(14) IDPVAR(15) IDPVAR(16) IDPVAR(17) IDPVAR(18) IDPVAR(19) IDPVAR(20) IDPVAR(21) IDPVAR(22) IDPVAR(23) IDPVAR(24) IDPVAR(25) IDPVAR(26) IDPVAR(27) IDPVAR(28) IDPVAR(29) IDPVAR(30) IDPVAR(31) IDPVAR(32) IDPVAR(33) IDPVAR(34) IDPVAR(35) IDPVAR(36) IDPVAR(37) IDPVAR(38) IDPVAR(39) IDPVAR(40) IDPVAR(41) IDPVAR(42) IDPVAR(43) IDPVAR(44) IDPVAR(45) IDPVAR(46) IDPVAR(47) IDPVAR(48) IDPVAR(49) IDPVAR(50) IDPVAR(51) IDPVAR(52) IDPVAR(53) IDPVAR(54) IDPVAR(55) IDPVAR(56) IDPVAR(57) IDPVAR(58) IDPVAR(59) IDPVAR(60) IDPVAR(61) IDPVAR(62) IDPVAR(63) IDPVAR(64) IDPVAR(65) IDPVAR(66) IDPVAR(67) IDPVAR(68) IDPVAR(69) IDPVAR(70) IDPVAR(71) IDPVAR(72) IDPVAR(73) IDPVAR(74) IDPVAR(75) IDPVAR(76) IDPVAR(77) IDPVAR(78) IDPVAR(79) IDPVAR(80) IDPVAR(81) IDPVAR(82) IDPVAR(83) IDPVAR(84) IDPVAR(85) IDPVAR(86) IDPVAR(87) IDPVAR(88) IDPVAR(89) IDPVAR(90) IDPVAR(91) IDPVAR(92) IDPVAR(93) IDPVAR(94) IDPVAR(95) IDPVAR(96) IDPVAR(97) IDPVAR(98) IDPVAR(99) IDPVAR(100)

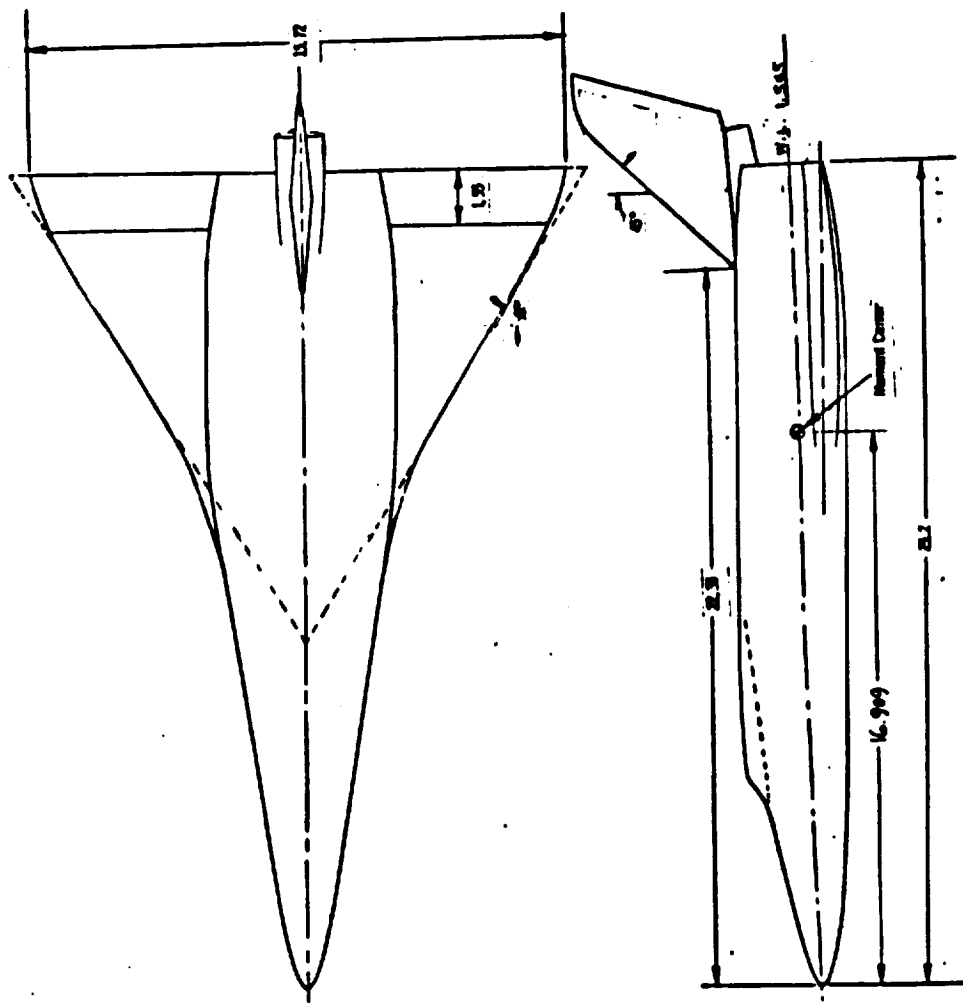
a of b
 SCHEDULES
 A) -2° -> 26°, A=2°

NASA-SPC-1141P

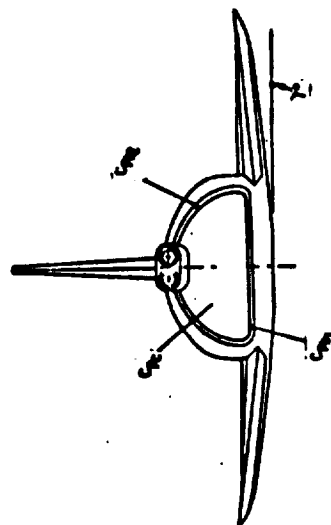
DELTA WING ORBITER
 NR
 DR#1107 B-1- 619

DELTA WING ORBITER
NR
DR#1107 B-1- 620

EXHIBIT 13
OF FOUR QUALITY



Reference Dimensions
Area = .0765 Sq. Ft.
Span = 15.913 in.
MAC = 0.783 in.



Reference Drawing 1042 990-1349
All dimensions are in inches.

FIGURE 2. LANGLEY 25.2" NR DELTA WING ORBITER MODEL

ORIGINAL PAGE IS
OF POOR QUALITY

TEST CPIT No. 62 DATA SET ORGANIZATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD. ID	CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS / MIN NUMBER									
			δ_{el}	δ_{cl}	δ_{cr}	δ_{tr}		10.4	10.55	11	12	13	14	15	16	17	18
RMT024	B W V1	A	0	0	0	0	1										
028		A	0	0	0	0	1										
034		A	0	15	15	0	0										
035		A	0	15	15	0	0										
032		A	0	15	15	0	0										
033		A	0	15	15	0	0										
039		A	0	0	30	-15	0										
040		A	0	0	30	-15	0										
041		A	0	0	0	0	-20										
042		A	0	0	0	0	-20										
045		A	0	0	0	0	-20										
015		B	0	-15	-15	0	0	15									
015		B	0	-15	-15	0	0	16									
015		B	0	-15	-15	0	0	9									
019		B	0	-30	-30	0	0	10									
021		B	0	-30	-30	0	0	21									
022		B	0	-30	-30	0	0	22									
017		B	0	-30	-30	0	0	17									
015		B	0	-30	-30	0	0	18									
015		B	0	-30	-30	0	0	13									

$$\delta_e = \frac{\delta_{cl} - \delta_{er}}{2}$$

$$\delta_e = \frac{\delta_{cl} + \delta_{er}}{2}$$

DELTA WING ORBITER
NR
DR#1113 B-1- 621

8 OF 8

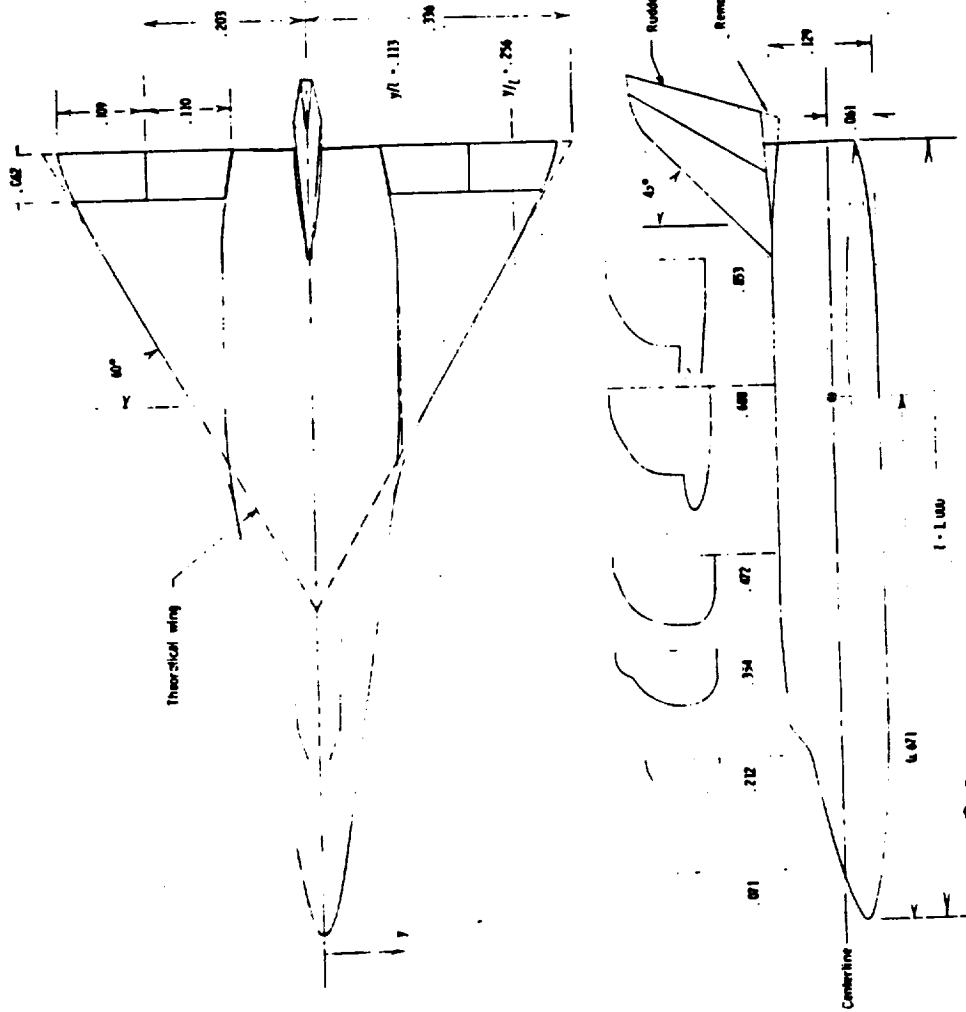
BETA D/PSE) ICN ICA ICIM ICBL ICYN ICY MACH ALPHA
COEFFICIENTS: IDPVAR(1) IDPVAR(2)

TEST CPHT No. 62 **DATA SET - ORGANIZATION - SHEET**

SCHEDULES or a

SSD-1

ORIGINAL PAGE IS
OF POOR QUALITY



1 - 2128 inch Full Scale
 1 - 11.718 inch (0.0555 model scale)

Wing
 at $y/l = .113$ - NACA 0029-44 6° incidence
 at $y/l = .254$ - NACA 0012-44 5° incidence
 7° dihedral at trailing edge

Vertical tail
 10° wedge section
 rudder hinge line at 60° chord

ORIGINAL PHOTO
 OF POOR QUALITY

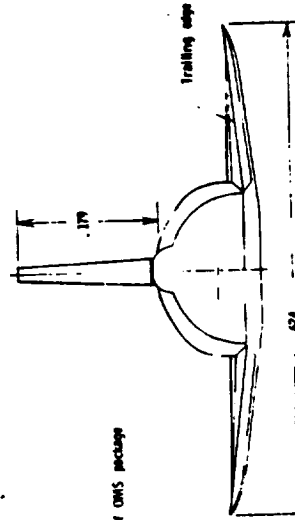


FIGURE 4. DRAWING OF NAR 134D ORBITER. DESIGN DIMENSIONS ARE NORMALIZED TO FUSELAGE LENGTH, l .

DELTA WING ORBITER
NR
DR#1113 B-1- 624

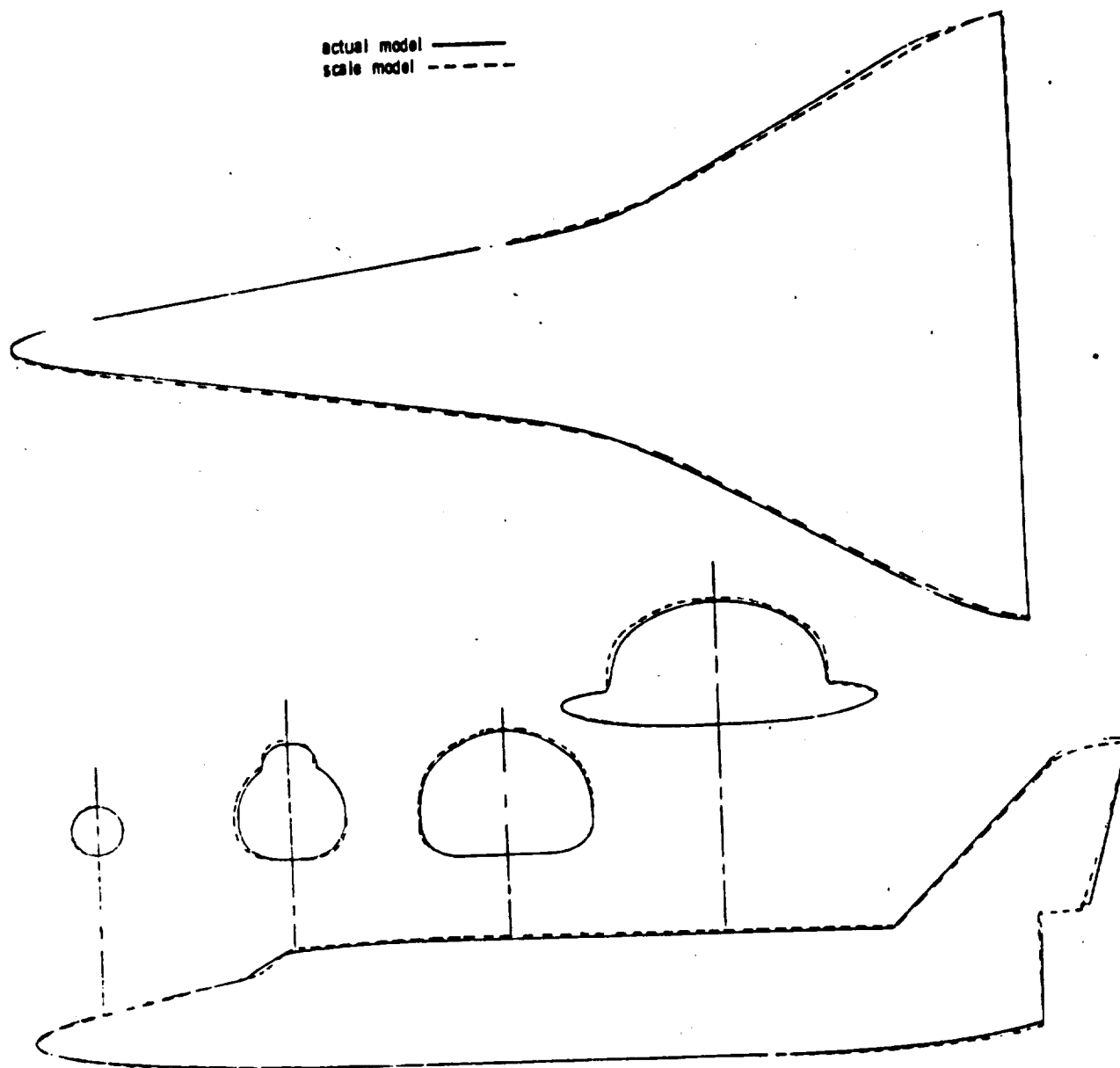


FIGURE 5. ACCURACY OF TEST MODEL GEOMETRY.

ORIGINAL PHOTO
OF POOR QUALITY

TABLE II. TEST NSFC-TW1477 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHE.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS											
		A	B	1	2	3	4		1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2
R2600A	B5WITEHVIZX	A	0	0	0	0	0	7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
R2600B	Y	B	0	0	0	0	0	7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
R2600C	Y	C	0	0	0	0	0	7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
R2600D	B5WITEHVIZX	D	0	0	0	0	0	7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

1 7 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 3.1 3.7 4.3 4.9 5.5 6.1 6.7 7.5 7.6
CLM CL CLM CX CSL CCB CDE XCP
 COEFFICIENTS:
 a or b AX = 0.50 DX = 50.0
 SCHEDULES BX = 20.0 CX = 40.0

DELTA WING ORBITER
NR
DR#1114 8-1-625

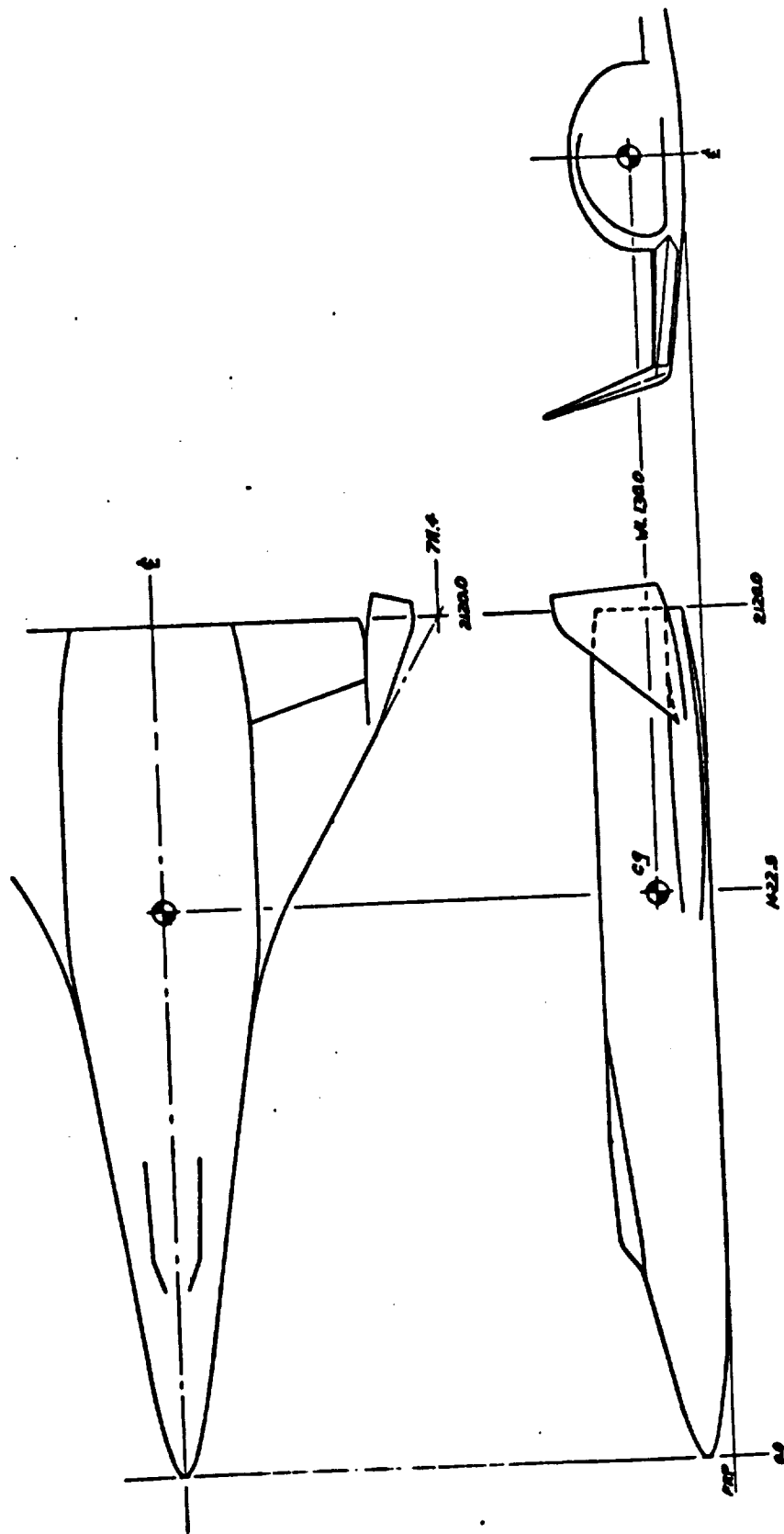


Figure 2. North American Rockwell Delta Wing Orbiter

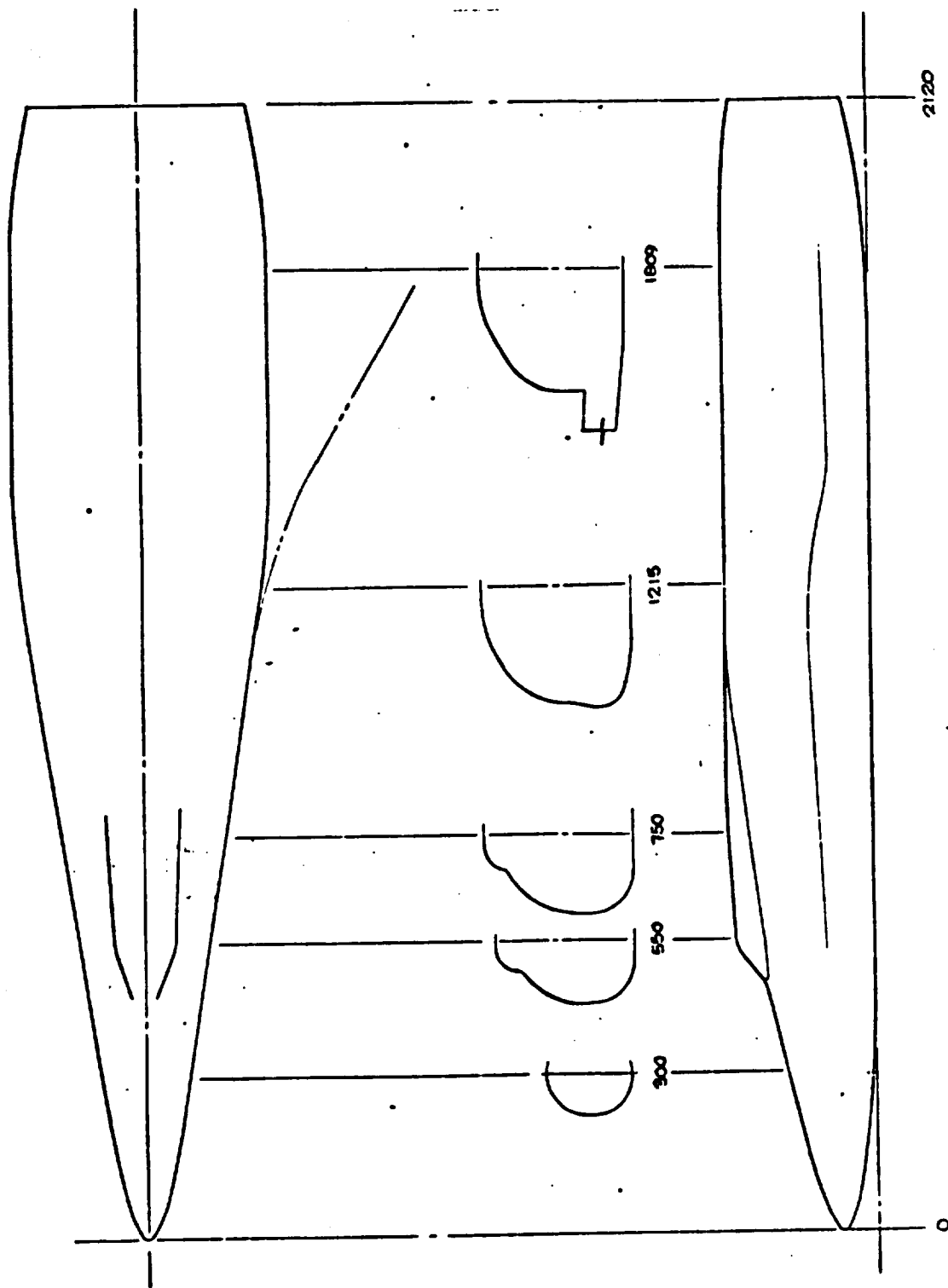
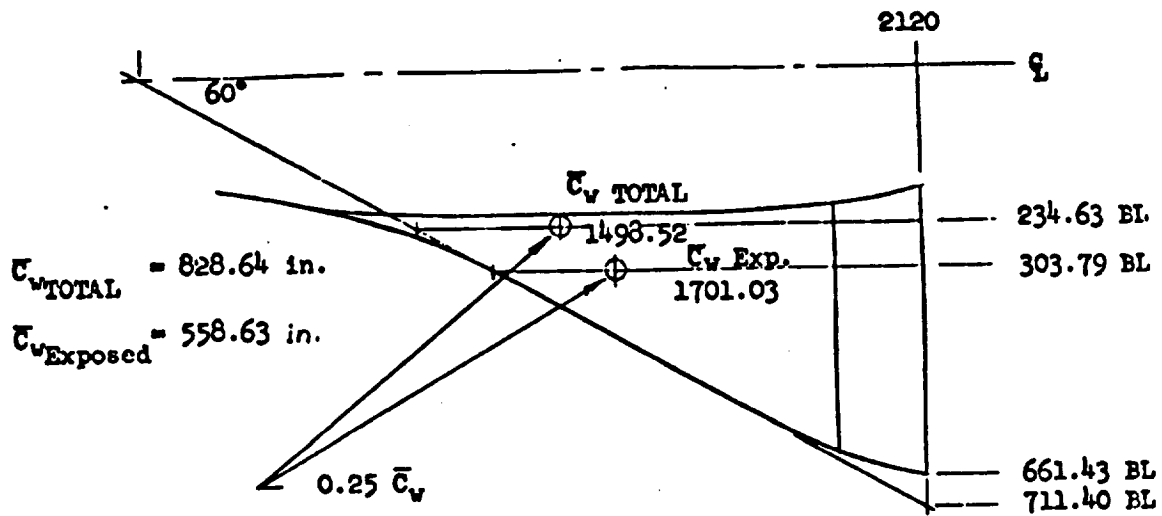


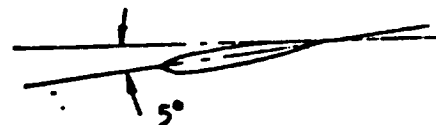
FIGURE 3. BODY B5 9592-134 B CONFIGURATION

2120

DELTA WING ORBITER
NR
DR#1114 B-1- 627



CHORD (BL 241.80)
0009-64 SERIES AIRFOIL



TIP CHORD (BL 546.07)
0012-64 SERIES AIRFOIL

FIGURE 4. WING W_{17} 9992-134 D Configuration

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1114 B-1- 629

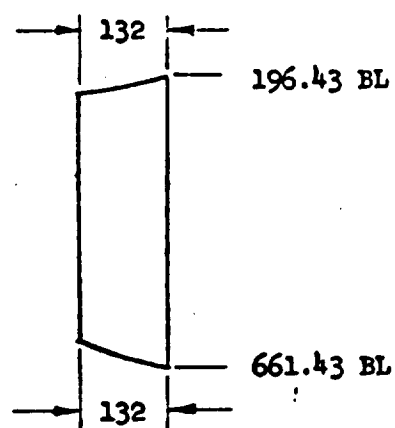


FIGURE 5. ELEVON, E 10-ELEVON USED WITH WING W17

DELTA WING ORBITER
 NR
 DR#11114 B-1- 630

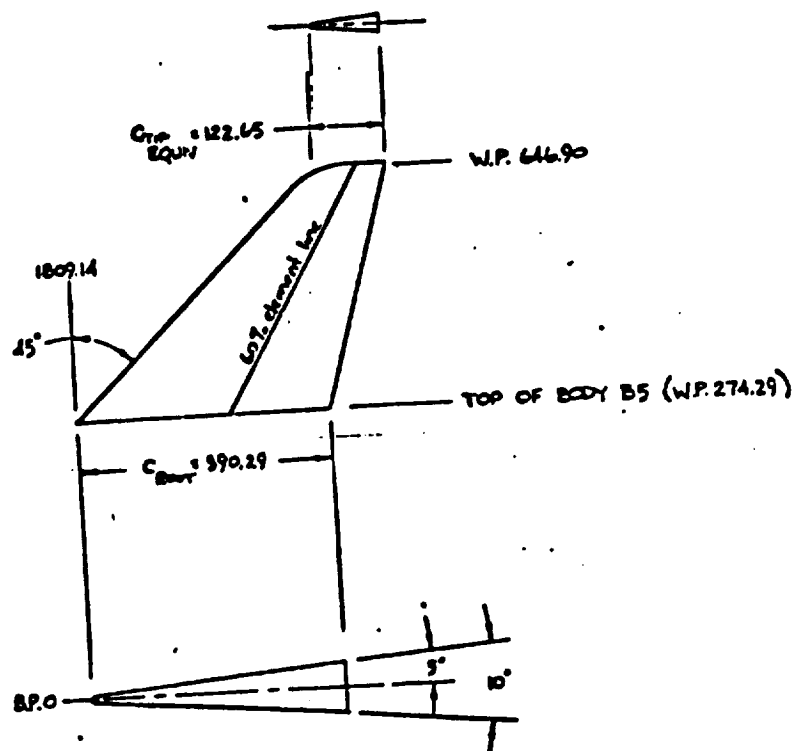


Figure 6. Vertical Stabilizer V₁₇

TEST NAAL 633

PRETEST
POSTTEST

Upper/Left/
Lower/Right

COEFFICIENTS:

$\alpha(A) = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 32, 36, 40$

$$\alpha(B) = 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20$$

SCHEDULES

DELTA WING ORBITER
NR
DR#1124 B-1- 631

DELTA WING ORBITER
NR
DR#1124 8-1- 632
☐ PRETEST
☒ POSTTEST

TEST MAL 633 DATA SET COLLATION SHEET

ORIGINAL PAGE IS
OF POOR QUALITY

Left/ Right

DATA SET IDENTIFIER	CONFIGURATION	SCHD.	PARAMETERS/VALUES						NO. of RUNS	MACK NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
			α	β	δR	δV	$\delta \Gamma$	δJ		.26	21	22	23	24	25	26	27	28	29
RCJ 021	B4W16T123	A 0°	-	-	-	-	-	-	5%										
022			-	-	-	-	-	-	10%										
023			-	-	-	-	-	-	20%										
024			-	-	-	-	-	-	5%										
025			-	-	-	-	-	-	10%										
026			-	-	-	-	-	-	20%										
027	B4W16T23T		-10°	-	-	-	-	-											
028			-20°	-	-	-	-	-											
029			-30°	-	-	-	-	-											
030	B4W16T23		-	-	-	-	-	-											
031	B4W16T24		-	-	-	-	-	-											
032	B4W16T24J		-	-	-	-	-	-	15°										
033	B4W16T25J		-10°	-	-	-	-	-											
034			-20°	-	-	-	-	-											
035			-30°	-	-	-	-	-											
036	B4W16T24R8J		-10°	-	-	-	-	-											
037			-20°	-	-	-	-	-											
038			-30°	-	-	-	-	-											
039	B4W16T24J		-	-	-	-	-	-	30°										
040	B4W16T23T23	B	-	-	-	-	-	-											

COEFFICIENTS:
u or β
SCHEDULES
 α (A) = 0.2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 32, 36, 40
 α (B) = 0.2, 4, 6, 8, 10, 12, 14, 16, 18, 20
 β (C) = -5, -4, -3, -2, -1, 0, +1, 2, 3, 4, 5, 6, 8, 10

TEST NAU 633 DA-A SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		L.H. R.H.			NO. of XUHS	MACH. MEMBERS (ON ALTERNATE INDEPENDENT VARIABLE)									
		α	β	δE_A	δE_B	δE_C		.26									
PCJ 041	B4tr3V16tr3V23tr3	B	0°	-	-	-	-	41									
042	B4tr2V16tr2V23tr2			-	-	-	-	42									
043	Y			-	-	-	-	43									
044	B4tr2V18tr2V10tr2			-	-	-	-	44									
045	B4tr3V18tr3V10tr3			-	-	-	-	45									
046	B4V10	Y		-	-	-	-	46									
047	B4V10	A		-15°	-15°	-	-	47									
048				-5°	+5°	-	-	48									
049				-5°	+5°	-	-	49									
050				-5°	-5°	-	-	50									
051	B4V10R3			-5°	-5°	-10°	-10°	51									
052	Y			+15°	-15°	-10°	-10°	52									
053	B4V10			+15°	-15°	-	-	53									
054				-15°	-15°	-	-	54									
055				-15°	+15°	-	-	55									
Y 056	Y	Y	Y	-30°	-30°	-	-	56									

7 13 19 25 31 37 43 49 55 61 67 73 75 76

COEFFICIENTS: α (A) = 0.2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 32, 36, 40

α or β α (B) = 0.2, 4, 6, 8, 10, 12, 14, 16, 18, 20

SCHEDULES β (C) = -5, -4, -3, -2, -1, 0, +1, 2, 3, 4, 5, 6, 8, 10

DELTA WING ORBITER
NR
DR#1124 B-1- 633

DELTA WING ORBITER
NR
DR#1124 8-1- 634

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

$X_{c.g.} = 1422.5 \text{ in (10.854 M.S.)}$

$Z_{c.g.} = 130.0 \text{ in (0.992 M.S.)}$

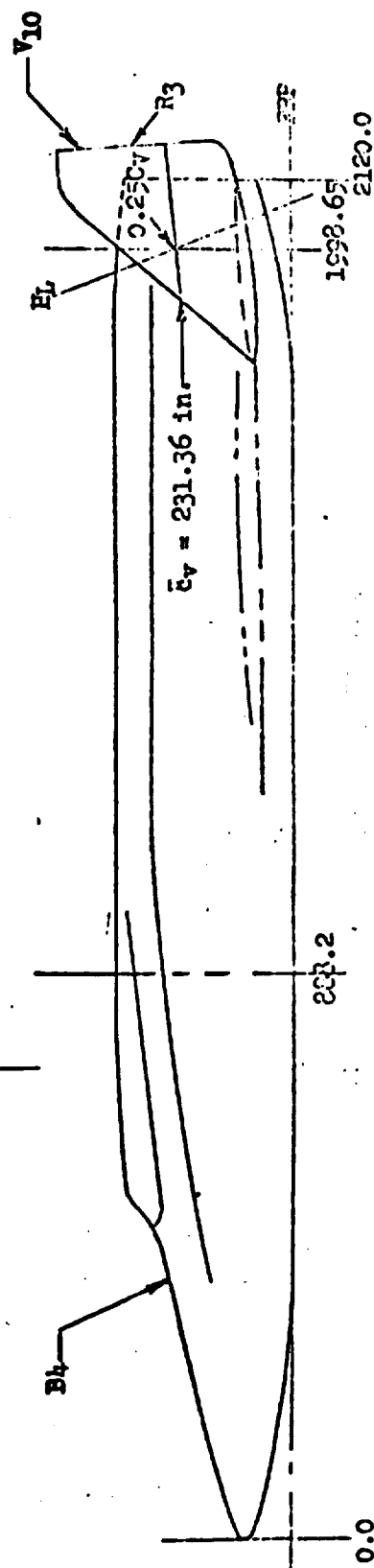
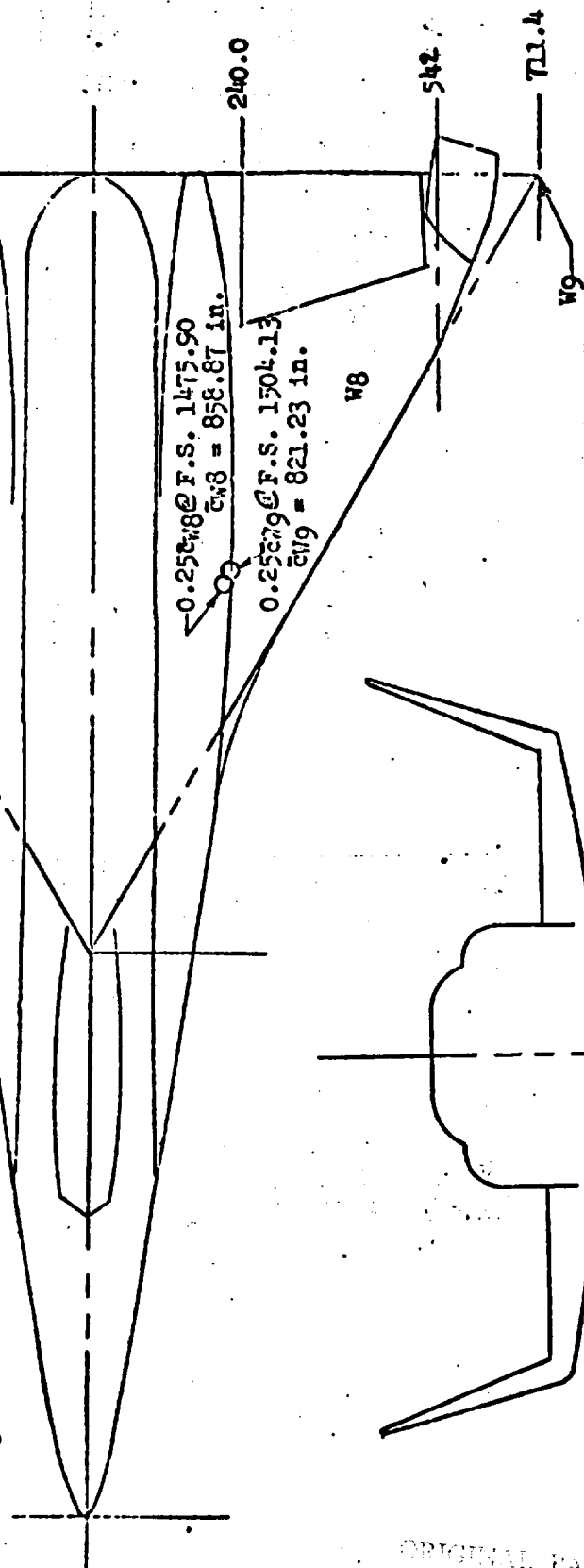


FIGURE 3. DELTA WING ORBITER WITH TWIN TAILS

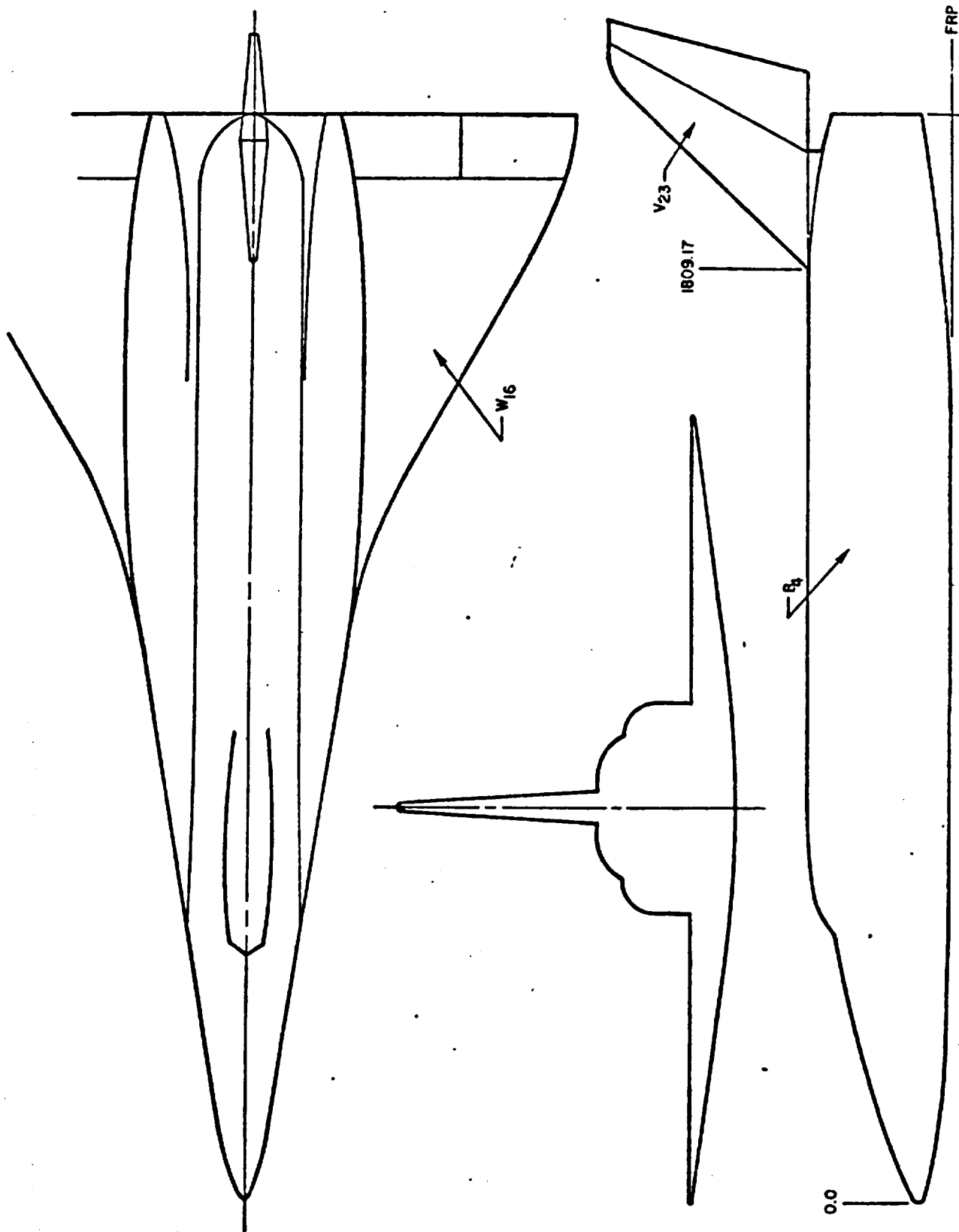


FIGURE 4. DELTA WING ORBITER WITH CENTERLINE VERTICAL TAIL

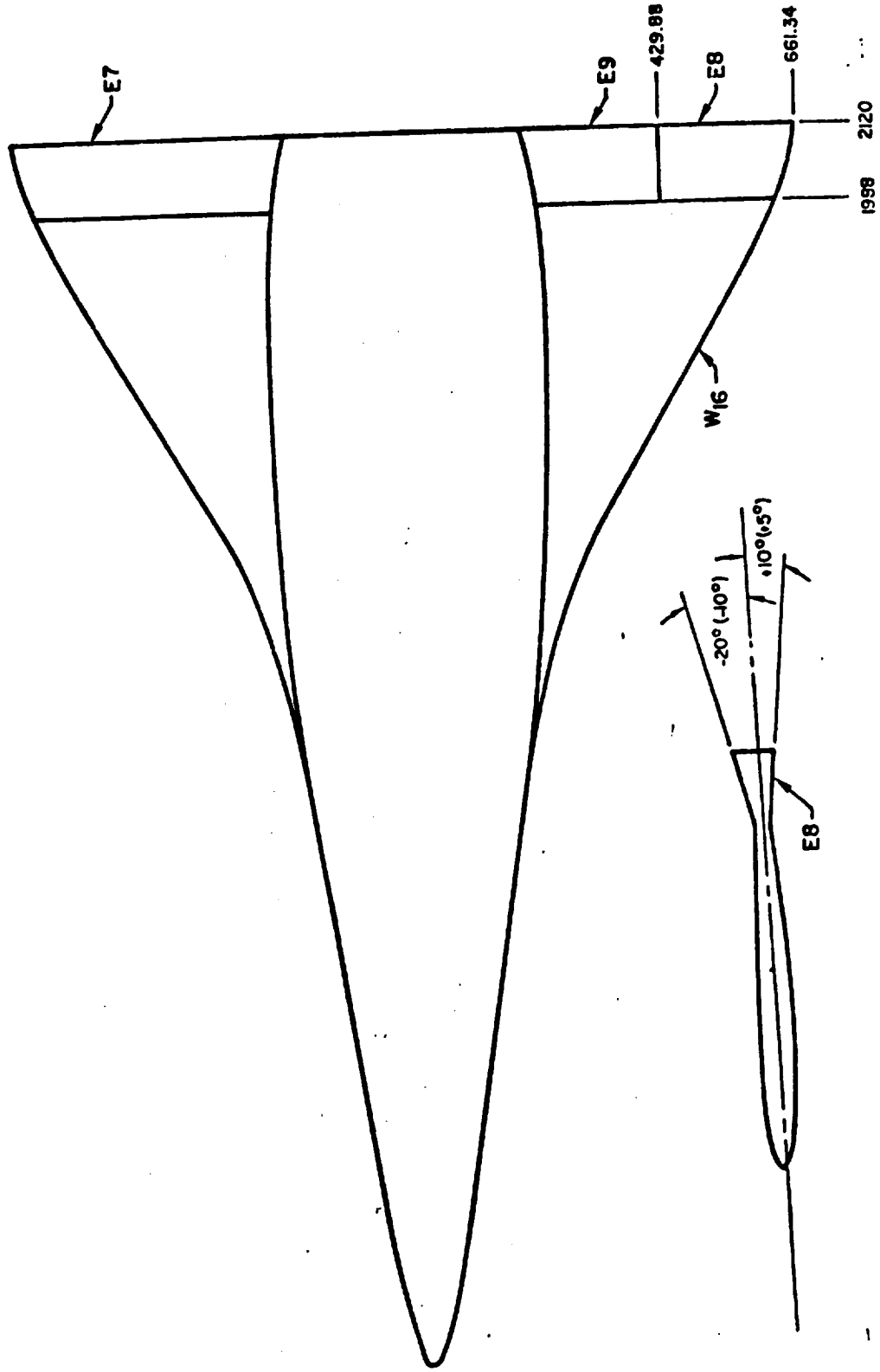


FIGURE 5. ELEVONS USED WITH WING W16

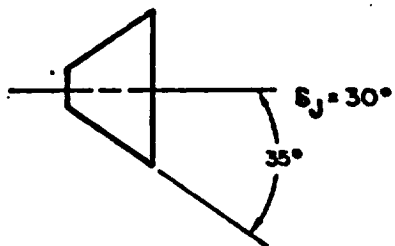
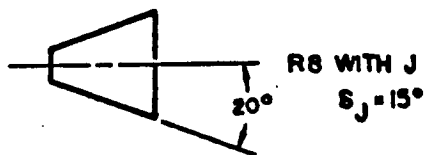
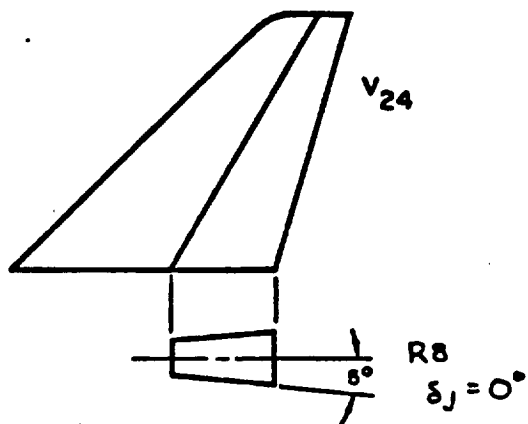
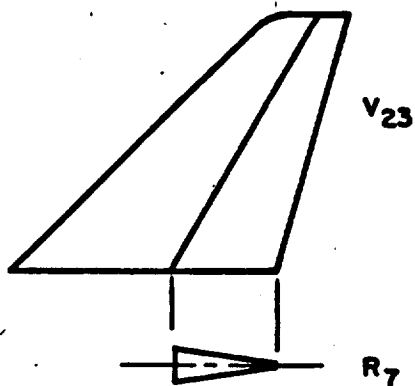


FIGURE 6. TRAILING EDGES OF VERTICAL TAILS AND RUDDERS

DELTA WING ORBITER
NR
DR#1126 B-1- 638

TABLE II. TEST TWT-484 DATA SET COLLATION SHEET

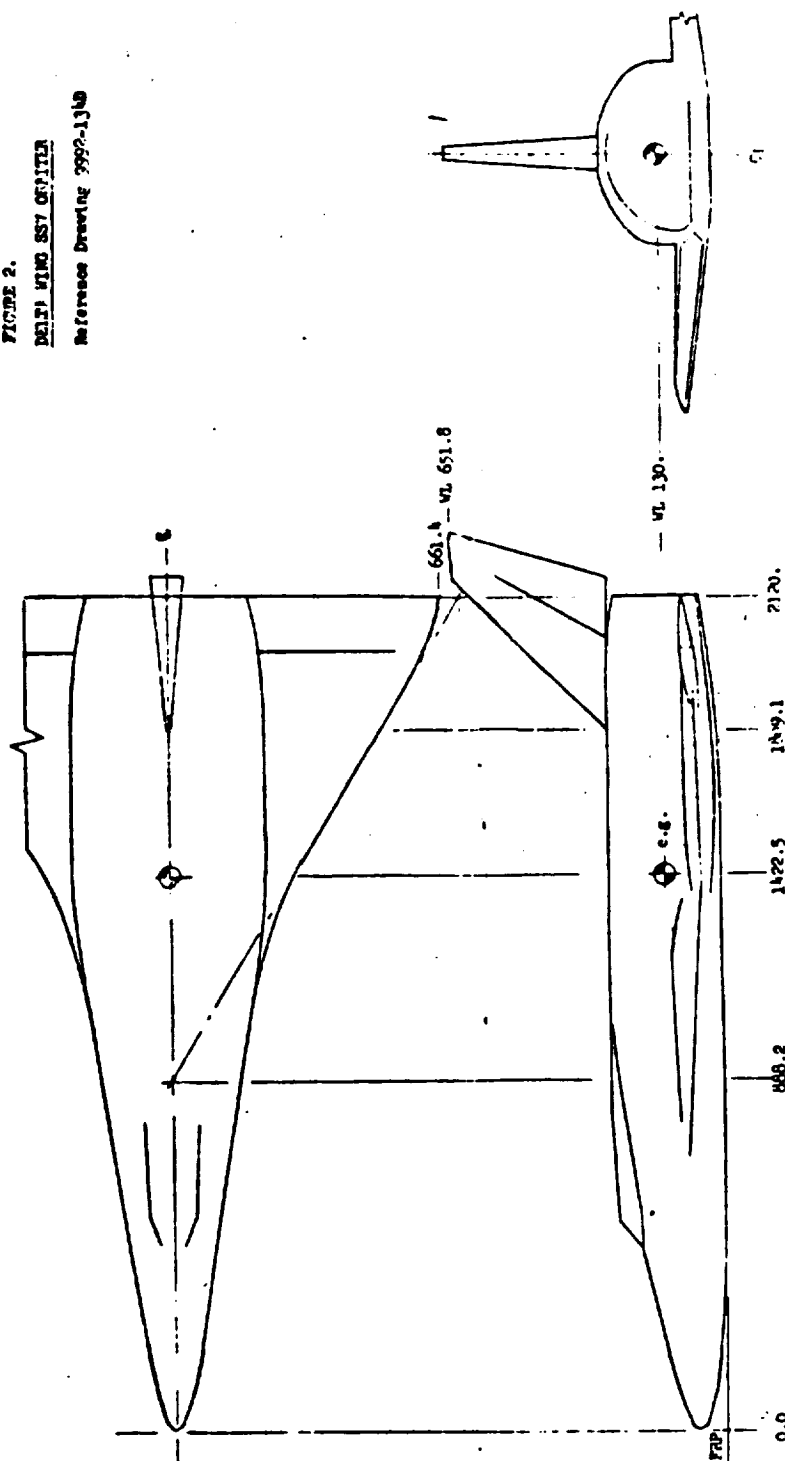
Force-Delta Wing Orbiter, 0.0035-Scale Stability & Control

☐ PRETEST
☒ POSTTEST

DATA SLT IDENTIFIER	CONFIGURATION	SCHED.		CONTROL DEFLECTION		NO. OF MINS.	MACH NUMBERS									
		A	B	SE	SA		0.6	0.9	1.0	1.1	1.2	1.46	1.96	2.99	4.0	4.96
02A	02A 05W17E10X	A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
03A	03A 05W17E10	A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
04A	04A 05W17E10J2	A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
05A	05A 05W17E10V17J2	A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
06A	06A 05W17E10V17J2X	A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
06B		B	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
07A		A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
07B		B	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
08A		A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
08B		B	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
09A		A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
09B		B	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
10A		A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
10B		B	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
11A		A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
11B		B	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
12A		A	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
12B		B	0	0	0	5	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0
06C		C	0	0	0	10	049/0047/0	042/0044/0	049/0045/0	049/0046/0	049/0047/0	049/0048/0	049/0049/0	049/0050/0	049/0051/0	049/0052/0

1	7	11	19	25	31	37	43	49	55	61	67	75
CLM	KL	KLN	LY	KSL	FDB	ISD	IL/D	KCP	IDPVAR(1)	IDPVAR(2)	IDPVAR(3)	IDPVAR(4)
COEFFICIENTS:												
a or b												
SCHEDULES												
$\alpha_A = -10 - 5 - 6 - 4 - 2 - 0 - 2 - 4 - 6 - 8 - 10$ $\alpha_B = 10 - 12 - 14 - 16 - 18 - 20 - 22 - 24 - 26 - 28 - 30$ $\alpha_C = -10 - 5 - 0 - 4 - 2 - 0 - 2 - 4 - 6 - 8 - 10$												
740												

FIGURE 2.
DELTA WING SST ORBITER
Reference Drawing 9992-1360



DELTA WING SST ORBITER
OF ROOR QUALITY

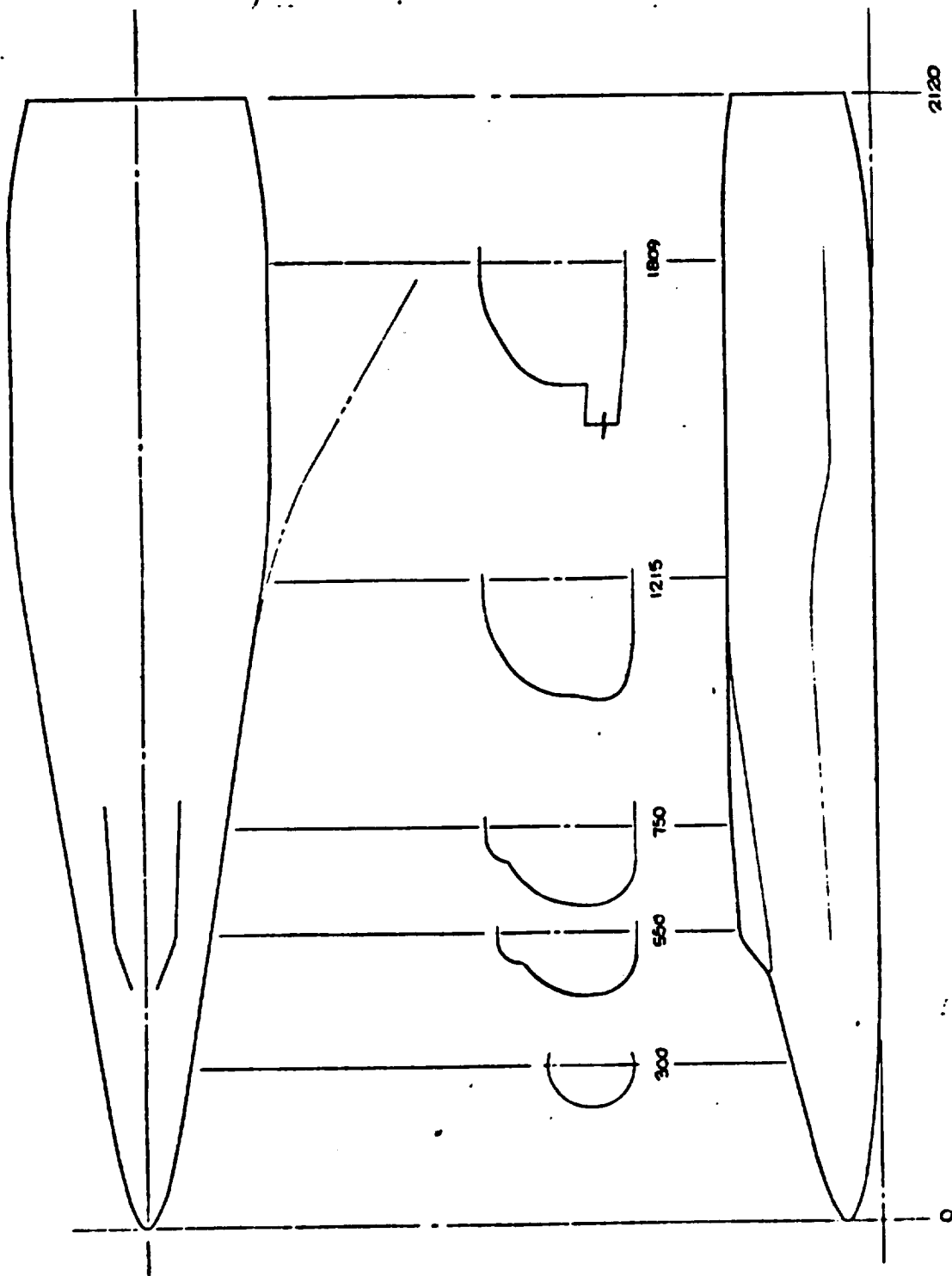
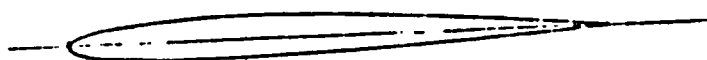
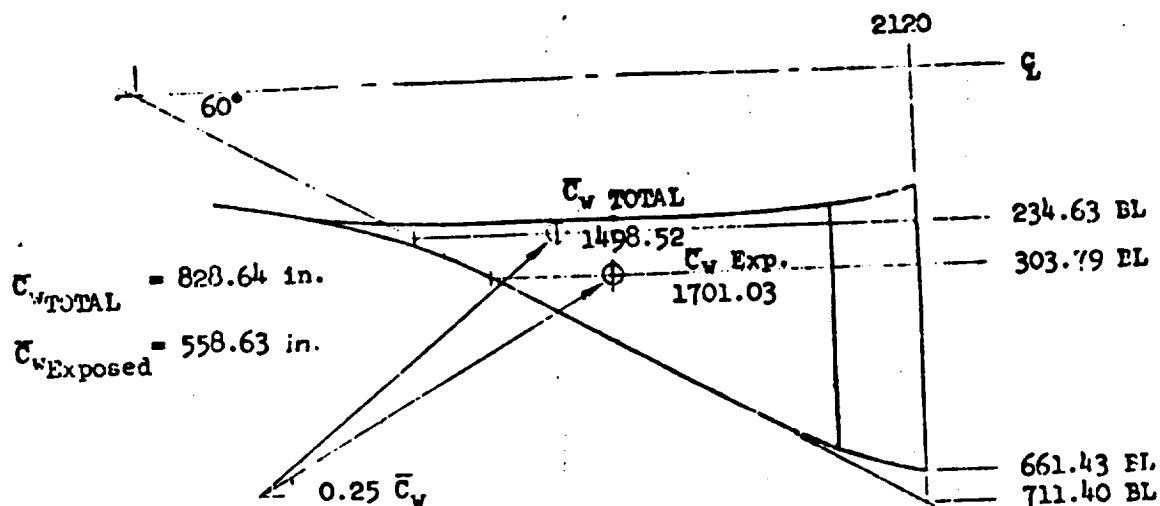
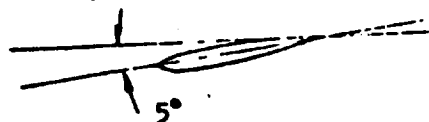


FIGURE 3. BODY 25 9992-134B CONFIGURATION

DELTA WING ORBITER
NR
DR#1126 B-1- 641



0009-64 SERIES AIRFOIL



0012-64 SERIES AIRFOIL

FIGURE 4. WING W₁₇ 9992-134 D Configuration

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

DELTA WING ORBITER
NR
DR#1126 B-1- 643

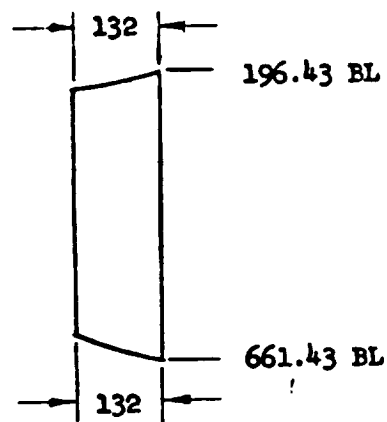


FIGURE 5. ELEVON, E 10-ELEVON USED WITH WING W17

DELTA WING ORBITER

NR

DR#1126 B-1-644

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

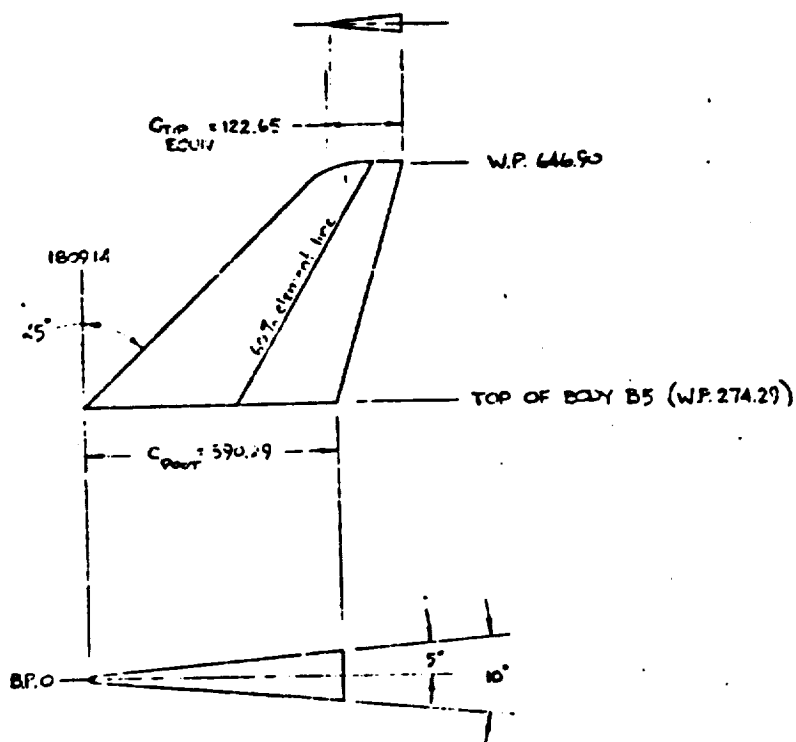
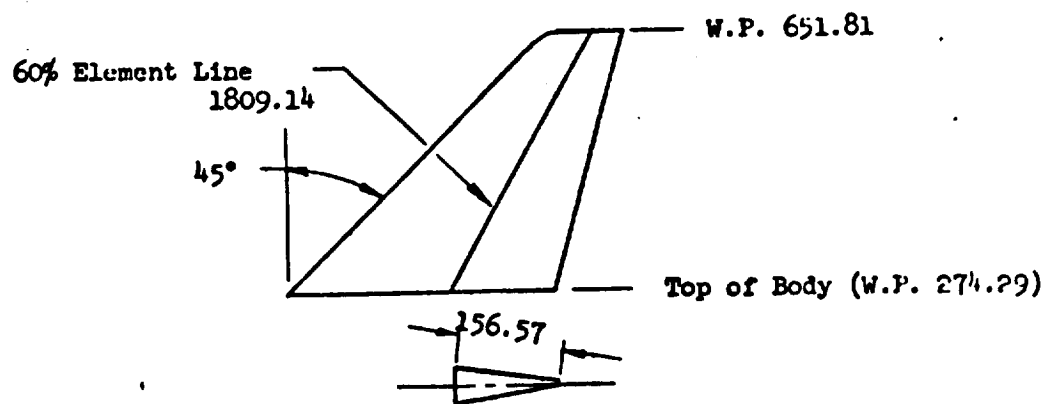
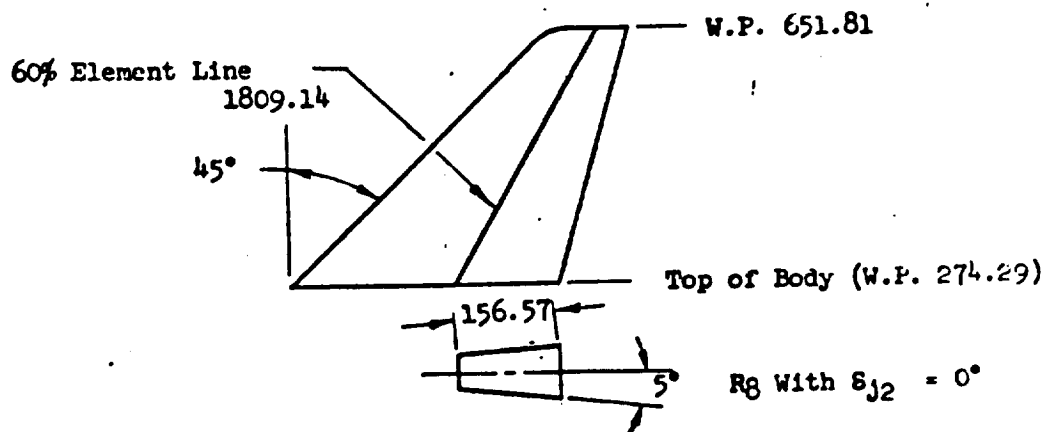


FIGURE 6.
VERTICAL STABILIZER VI7



VERTICAL TAIL V 16



VERTICAL TAIL V 17

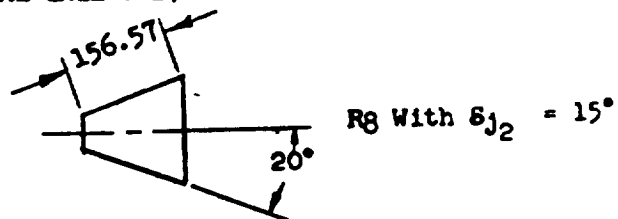


FIGURE 7. DRAG BRAKE J 2

DELTA WING ORBITER
NR
DR#1144 B-1- 646
☐ PRETEST
☒ POSTTEST

WASA-MSPC-WAF

CONSPIRACIES:

8 10 8

SCHEDULE 13

$X_{c.g.} = 1422.5 \text{ in. (10.854 M.S.)}$
 $Z_{c.g.} = 130.0 \text{ in. (0.992 M.S.)}$

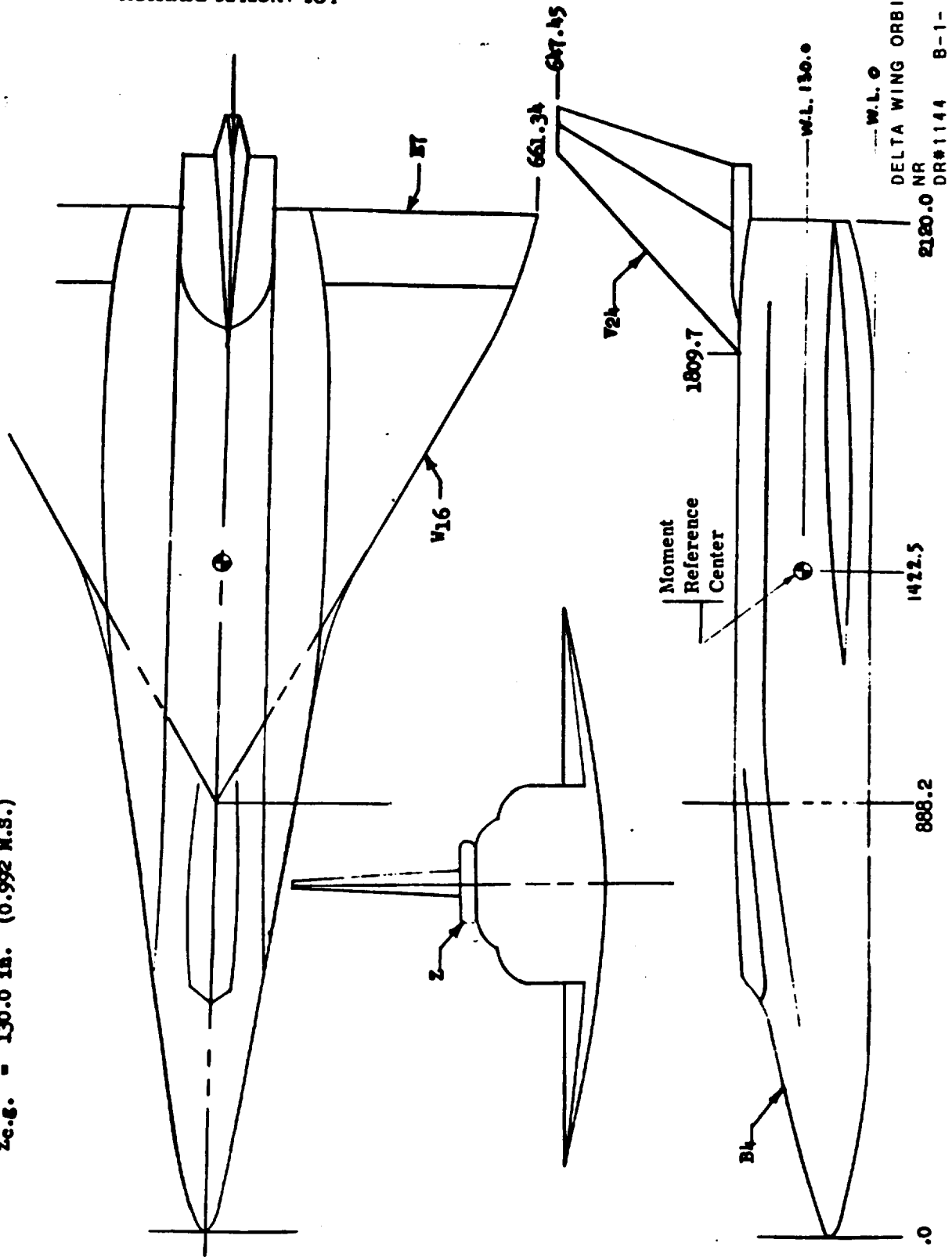


Figure 4. 3 VIEW SOURCE-DELTA WING ORBITER

WING	$\bar{C}_{H/4}$	F.S.	\bar{c}
W16	1498.15		829.20
W18	1493.71		835.12
W19	1548.22		829.20
W20	1448.09		829.20

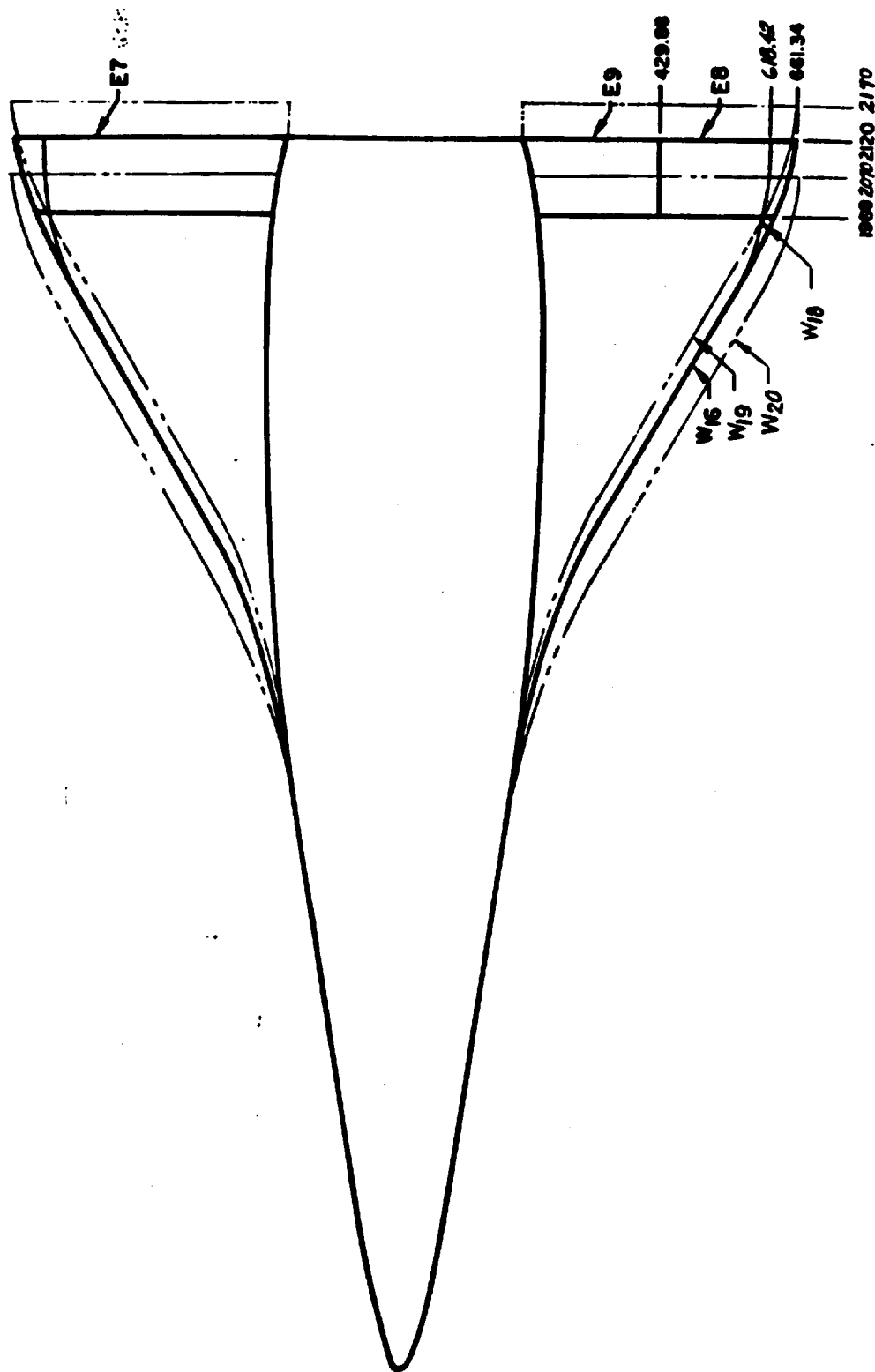
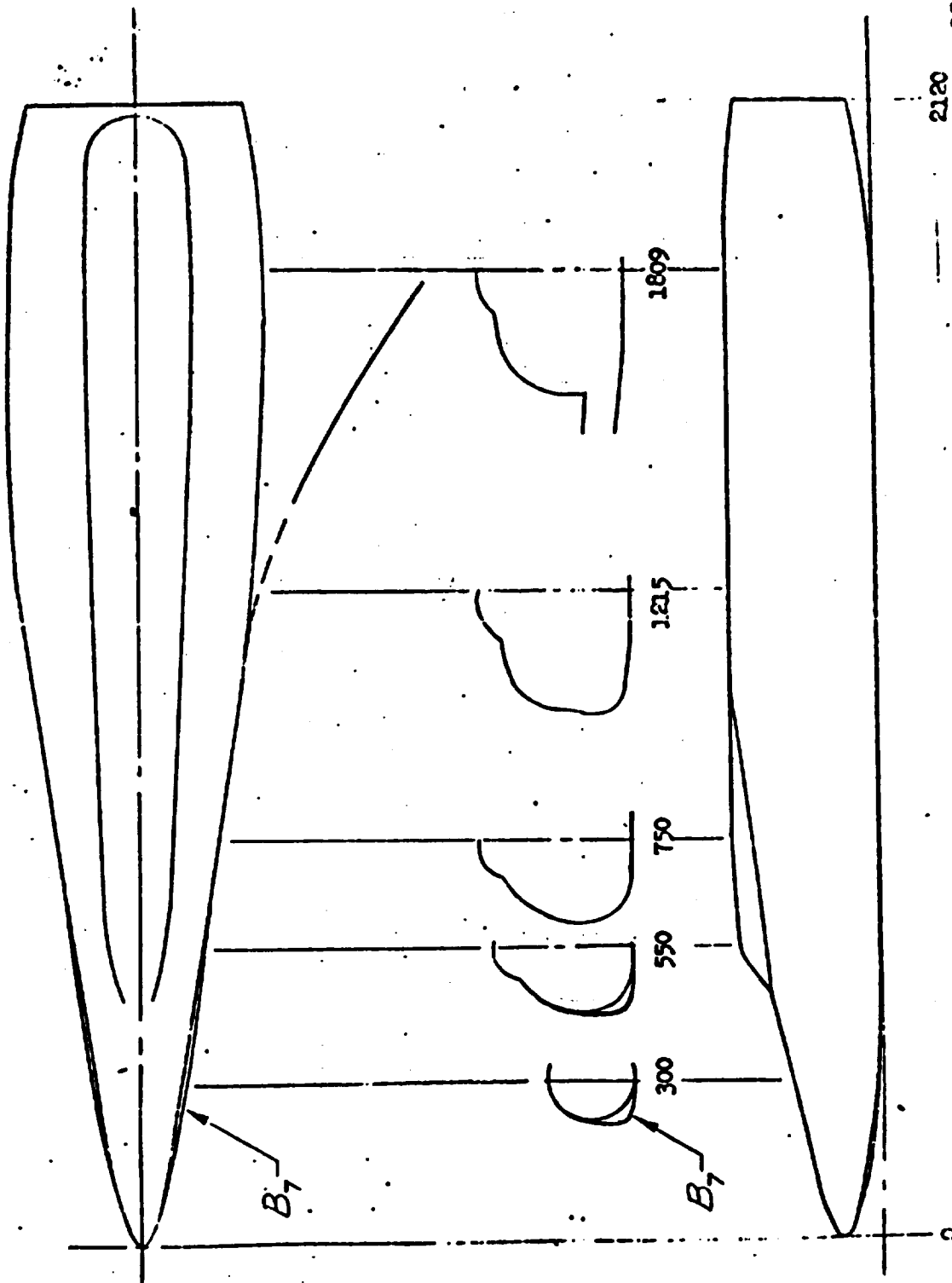


Figure 5. ALTERNATE WING POSITIONS 750

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

ORIGINAL PAGE IS
OF POOR QUALITY



2120

DELTA WING ORBITER

Figure 6. BCDI 34 9922-123 CONFIGURATION
Body 27 9922-123 Configuration with 151 Race Modification

NR
DR#1144 B-1- 649

DELTA WING ORBITER
NR
DR#1144 B-1- 650

TRAIL EDGES OF VERTICAL TAILS & RUDDERS- DELTA WING ORBITER

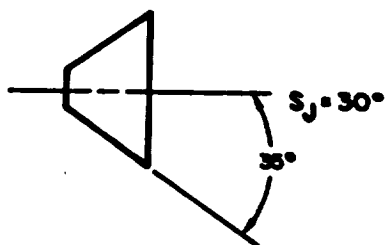
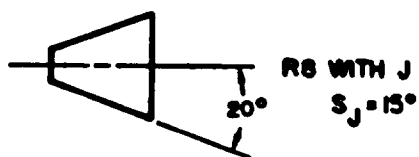
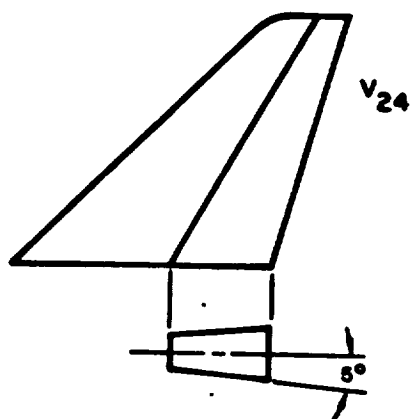
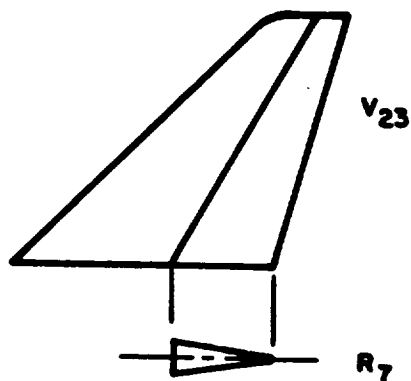


Figure 7. Trailing Edges of Vertical Tails and Rudders

ORIGINAL PAGE IS
OF POOR QUALITY

TEST 7386 & 7390 DATA SET ORGANIZATION SHEET

TEST TEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.			CONTROL DEFLECTION			NO. of RUNS	(7386)		(7390)		MACH NUMBERS	
		A	B	C	δ_e	δ_a	δ_R		20,3	1	20,3	1		
RNT 001	BSM17E10V17	A	0	0	0	0	0	1	1					
2	BSM17E10	0	0				--		2					
3		1.5					--		3					
4	BSM17E10V17	1.5					0		4					
10		C	0						10					
12	BSM17E10V17				0				12					
13					-15				13					
15					-30				15					
16					-45	0			16					
18					-30	15			18					
22					0	-15	15		22					
28					4.2	0	0		28					
29		C	4.2	30	0	0	0		29					
104	BSM17E10V17	A	0	0	0	0	0				4			
105					0		-15				5			
107					10		0				7			
108					4.5	0	0				8			
112					0		-15				12			
114		A			10		0				14			
120		B	0	0	0		0				20			

A-10, -7, -4, -2, 0, 2, 4, 7, 10, 13, 15, 17, 19

B 0, 4, 8, 12, 14, 16, 18, 20, 22, 24, 26, 29, 32, 36

C 19, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 53, 55

of 8
SCHEDULES

DELTA WING ORBITER
NR
DR#1176 B-1- 651

TEST

8 of 8
SCHEDULES

ORIGINAL PAGE IS
OF POOR QUALITY

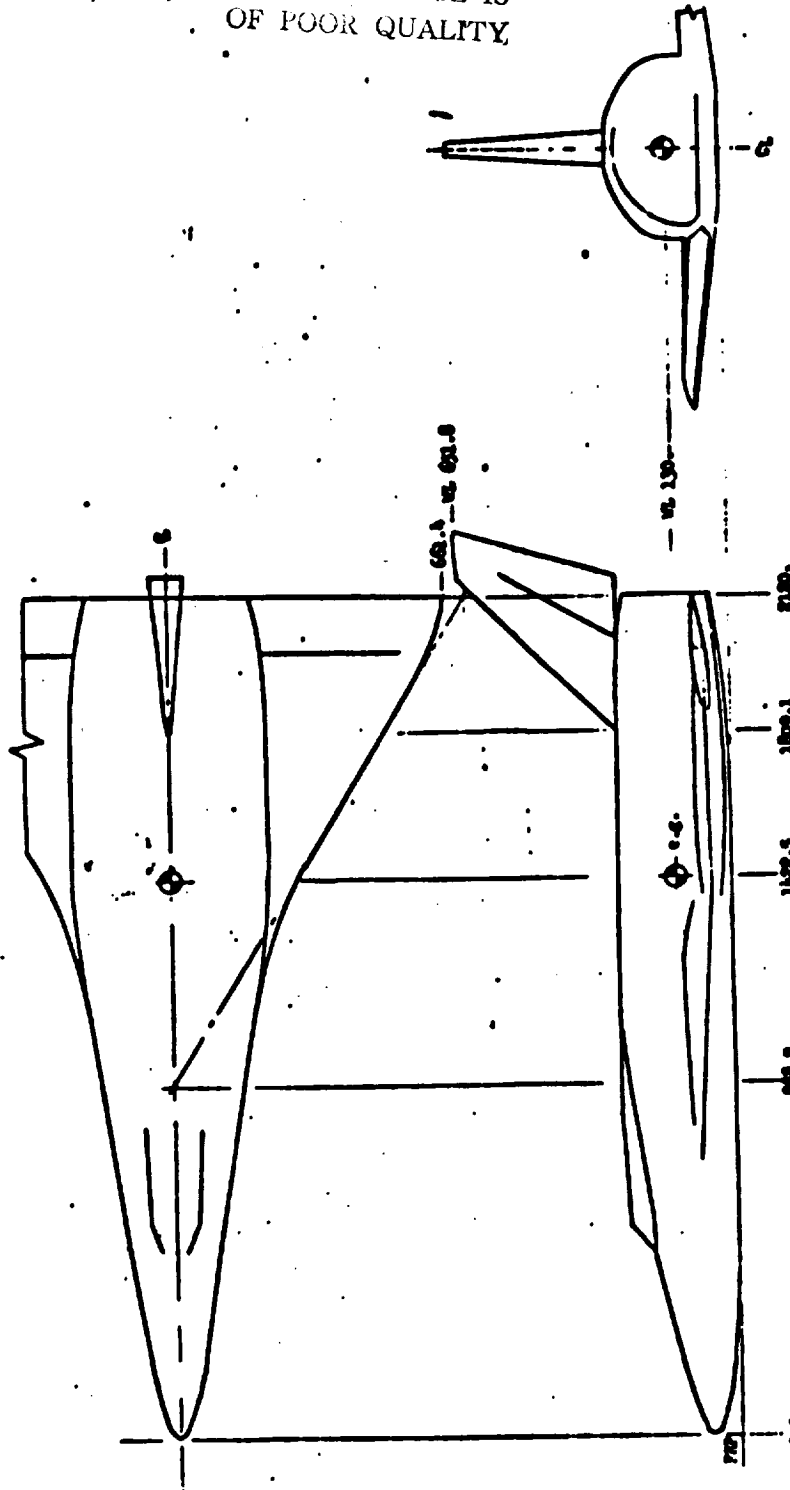


Figure 2. Delta Wing SSV Orbiter

DELTA WING ORBITER
NR
DR#1176 B-1- 653

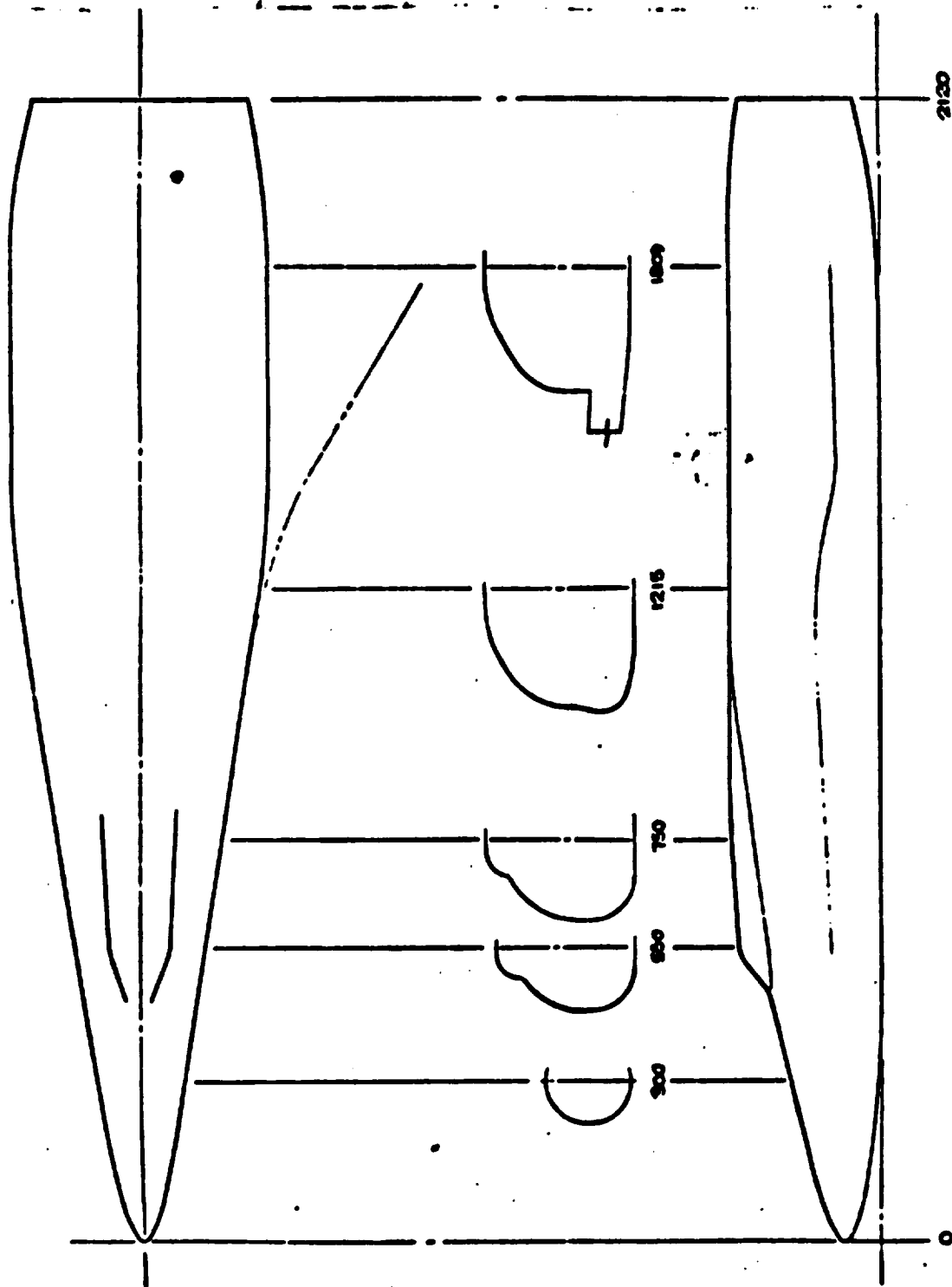
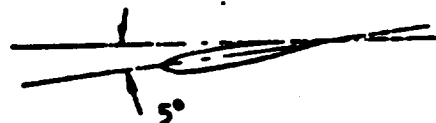
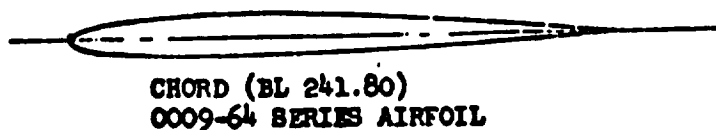
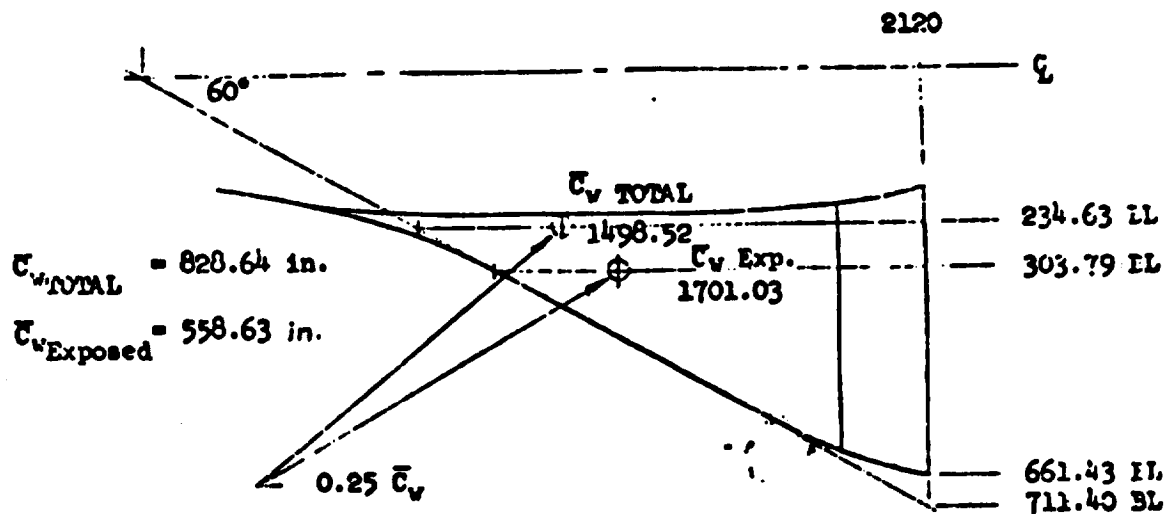


FIGURE 3. BODY P5 9:92-134B CONFIGURATION



TIP CHORD (BL 546.07)
0012-64 SERIES AIRFOIL

FIGURE 4. WING W₁₇ 9992-134 D Configuration

DELTA WING ORBITER
NR
DR#1176 B-1- 656

ORIGINAL PAGE IS
OF POOR QUALITY.

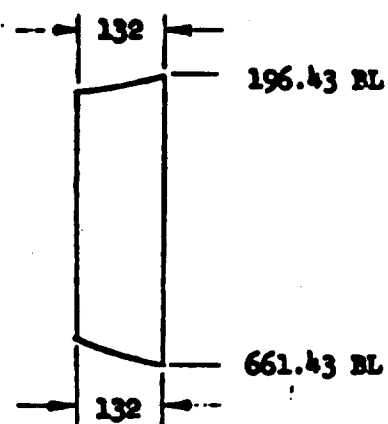


FIGURE 5. ELEVON, E 10-ELEVON USED WITH WING W17

DELTA WING ORBITER
NR
DR#1176 8-1-657

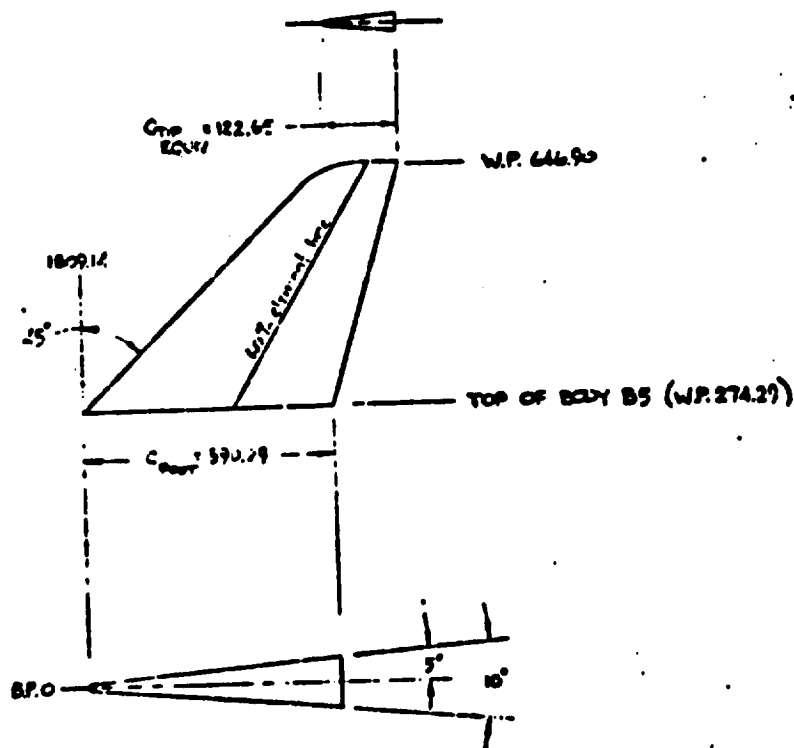


FIGURE 6.
VERTICAL STABILIZER V17

TEST MAIR LSWT 237 DATA SET COLLATION SHEET

(UNPOWERED)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION					NO. OF RUNS	ELEVTR				Hor's Tail Defl'n				
		a	b	S _H	S _E	S _F	S _{2g}	-15		-10	-5	0	-10	-5	0			
RC0040	B4H2V1	D	0						1					43				
41			5						1					44				
42		6	AA						1					45				
43		12							1					46				
44		D	0						1					47				
A00	B4H2V1H1			-	0				3						51	49	50	
01			5	-5					1					52				
02		6	AA						1					53				
03		12							1					54				
04		D	0						4	58	57	56	55					
05									1					95				
A10	B4H2V1H1F2	E	0			45			1					59				
11			5						1					60				
12		0	AA						1					61				
A20	B4H2V1H1F2G	F	0			45			4	67	67	68	62					
21			5						1					64				
22		0	AA						1					65				
23		6							1					66				
24		D	0			25			3		70	71	72					
RCDA 25			5	-5					1					73				

1	7	13	19	25	31	37	43	49	55	61	67	73	79
ELEVTR													
IDPVAR(1)													
HTAIL													
IDPVAR(2)													
NDV													

COEFFICIENTS:

a or b

SCHEDULES

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 659

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 660

TEST MCAIR LSWT 237 DATA SET COLLATION SHEET
(UNPOWERED)

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER		CONFIGURATION	SCHD.		CONTROL DEFLECTION					NO. OF RUNS	ELEVTR			FLAP			SPOTLR		
			a	R	δ_N	δ_d	δ_r	δ_{SB}	-10		-5	0	0	25	45	30/60/90/120			
RCDA 26		B4V2V1H1F2G	0	AA	-5			25		1			74						
27			6							1			75						
28			E	0	-10			-		2				76	77				
29					0			-		2				79	78				
30			C		-5			45		1			83						
ASO		B4V2V1H1F2GSP2	E							3						87	85	84	
51				5						1							86		
A 60		B4V2V1H1SP2	D	0						3						88	89	92	
61				5						1							90		
65		SP3		0						1							91		
A 90		B4V2V1H1SB1							60	1			93						
91		SB2							8A	1			94						
A 95		B4V2V1H1N1	D	0	-5					1			96						
96		A2							20	1			98						
97		B4V2V1H1A2	F							1			97						
98		B4V2V1H1A2N1F2G						45		1			99						
A 70		B4V2V1H1P2D4								1			101						
71				5						1			102						
RCDA 72		D3		0	-5					1			103						
1		7	11	19	25		31		37	43		49		55		61	67	73	

TDPMAR (1) POSTTEST

TDPMAR (1) TDPMAR (2) NOV

COEFFICIENTS:

a or b

SCHEDULES

ORIGINAL PAGE IS
OF POOR QUALITY

TEST MCAIR LSWT 237 DATA SET COLLATION SHEET

(UNPOWERED)

☐ PRETEST

☒ POSTTEST

IDPVAR (1)

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	ELEVTR			IDPVAR (1)									
		a	B	δW	δr	δz		-10	-5	0										
RCDA 73	B ₄ W ₂ V ₁ H ₁ P ₂ D ₁	F	0	-5			1			104										
74	D ₂						1			105										
75		5					1			106										
76		0	AA				1			107										
77		6					1			108										
78		F	0				1	110												
79	B ₄ W ₂ V ₁ H ₁ P ₂ D ₂						1	112												
80							1	113												
81		5					1	114												
RCDA 82		6	AA	-5			1	115												

1 7 13 19 25 31 37 43 49 55 61 67 73 79

ELEVTR IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS:

a or B

SCHEDULES

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 661

TEST McAER LSWT-237 DATA SET COLLATION SHEET
(UNPOWERED)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES					NO. OF RUNS	ELEVTR					IDPVAR(1)				
		α	β	δH	δF	δR	δS	δF		-15	-10	-5	0						
000902	B4W2V1H1F2G	E	0	0	0	25	0						79						
03						-10							76						
04						0	45						78						
05						-10							77						
06	B4W2V1H1	D				-5	0	20	30%				55						
07	B4W2V1H1SP2						0	0	60%				92						
08	B4W2V1H1F2GSP2	E				45							84						
09	B4W2V1H1SP2	D				0			30%				88						
10									60%				89						
11	B4W2V1H1SP3												91						
12	B4W2V1H1F2GSP2	E				45			30%				87						
13									40%				85						
14	B4W2V1H1SP2	D	5			0			60%				90						
15	B4W2V1H1F2GSP2	E				45							86						

ELEVTR

COEFFICIENTS:
 α : $D = -10 \rightarrow 0 \rightarrow 20$
 β or β : $E = -10 \rightarrow 0 \rightarrow 20$
SCHEDULES

TEST MGR LSNT 237 DATA SET COLLATION SHEET (POWERED)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		MACH/IDPVAR (1)	NO. of RUNS	PARAMETER NAMES AND VALUES						PAGE 1 OF 4
		a	b			SH	SE	SF	PE	RH	RHTB	
RCDB01	B4W2VH1P4	C	0	0.26		-5	0	0	0.99	1	1	
02		T	0	121					1.1			
03			0	123					3.4			
04			5	125					0.99			
05			5	126					3.4			
06			Y	182					3.4			
07			Y	181					0.99			
08		0	AA	129					3.4			
09		0	AA	131					0.99			
10		6	AA	132					1.1	0	Y	
11		C	0	135					1.1	1	0	
12		C	0	136					3.4	1	1	
13		6	AA	142					3.4	0	1	
14		C	0	143					3.4	0	1	
15		T	5	144					3.4	1	0	
16			0	145					3.4			
17			5	146					3.4			
18			0	160					0.99			
19			T	158					1.1			
20			T	159					3.4			
20		Y	Y	165					1.1	0	Y	

CL 7 13 19 25 31 37 43 49 55 61 67 73 75 76
ICD KLM ICY ICLN CSL CDB
COEFFICIENTS: α 1 C = -10° α 2 \rightarrow 20° IDPVAR(1) IDPVAR(2) NDY
a or b
SCHEDULES β : AA = -4° α 2 \rightarrow 10°

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 663

TEST MCAIR LSWT 237 DATA SET COLLATION SHEET
(POWERED)

☐ PRETEST

☒ POSTTEST

PAGE 2 OF 4

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		MACH/IDPVAR (1)	NO. OF RUNS	PARAMETER NAMES AND VALUES					
		a	b			SH	SE	SE	VE/PA	RH	BB
RCDB21	BHW2V1H1P4	C	O	0.26		-5	-10	0	3.4	0	1
22				168					1.1	1	0
23				167					3.4		0
24				173		0	0		0.99		1
25				172		0			3.4		
26				174		-10			0.99		
27				175		-10			3.4		
28				148		-5		45	0.99		
29	BHW2V1H1P4F2G			149					1.1		
30				150					3.4		
31				155			-10		0.99		
32				157					1.1		
33				156					3.4		
34	BHW2V1H1P2F2G			212			0		0.99		
35				213			0		3.4		
36				214			-10		0.99		
37				215					3.4		
38				220					3.4		
39	BHW2V1P4			180				0	0.99		
40				177				0	3.4		

1	7	13	19	25	31	37	43	49	55	61	67	73	79
CL	ICD	ICLN	KY	ICLN	CSL	ICD				IDPVAR(1)	IDPVAR(2)	IDV	

COEFFICIENTS:
a or b
SCHEDULES

TEST HCAIR LSMT 232 DATA SET COLLATION SHEET
(POWERED)

☐ PRETEST
☒ POSTTEST

PAGE 3 OF 4

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		MACH/IDPVAR (1)	NO. of RUNS	PARAMETER NAMES AND VALUES					
		a	b			SM	SE	SE	PE/PA	RHAB	RHVB
RCDB41	B1W2V1P2	C	0	0.238		-	-	0	0.99	1	1
42	↑			239		-	-		3.4		
43	B4W2V1H1P2			196		-5	0		0.99		
44				197					0.99		
45				198					1.1		
46				199					3.4		
47				200					0.99		
48		Y	5	201					3.4		
49		6	AA	202					0.99		
50		6	AA	203					3.4		
51		C	0	204					1.1	0	
52				205					3.4	0	
53		5		206					3.4	0	Y
54		5		207					3.4	1	0
55		0		209					1.1		0
56				208					3.4		0
57				221				-10	0.99		
58				222					3.4		Y
59				223					3.4	0	Y
60	↑	Y	Y	224		Y	Y	Y	3.4	1	0

7 11 13 19 25 31 37 43 49 55 61 67 75.74

CL ICD ICLN ICY ICLN CSL CDB

COEFFICIENTS:

a or b

SCHEDULES

IDPVAR(1) IDPVAR(2) IDV

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 665

ORIGINAL PAGE IS
OF POOR QUALITY

TEST MCAR ISWT 237 DATA SET COLLATION SHEET
(POWERED)

PRETEST

PAGE 10F4

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		NACH/IDPVAR (1)		NO. of RUNS	PARAMETER NAMES AND VALUES					
		α	β				δH	δF	δE	δP	δR	δQ	$\delta I$
RCDB61	B4W2V1H1P2	C	Q	0.26	229		-5	0	0	3.4	1	1
62				230			0		0.99			
63				231			0		3.4			
64				234			-10		0.99			
65				235			-10	Y	Y	3.4	Y	Y

	7	13	19	25	31	37	43	49	55	61	67	75.76
CL	100	100	100	100	100	100	100	100	100	100	100	100
ICLN												
ICY												
ICLN												
CSL												
CDB												

CONCENTRATIONS:

↑ IDPVAR(1) IDPVAR(2) NDV

0 20 8

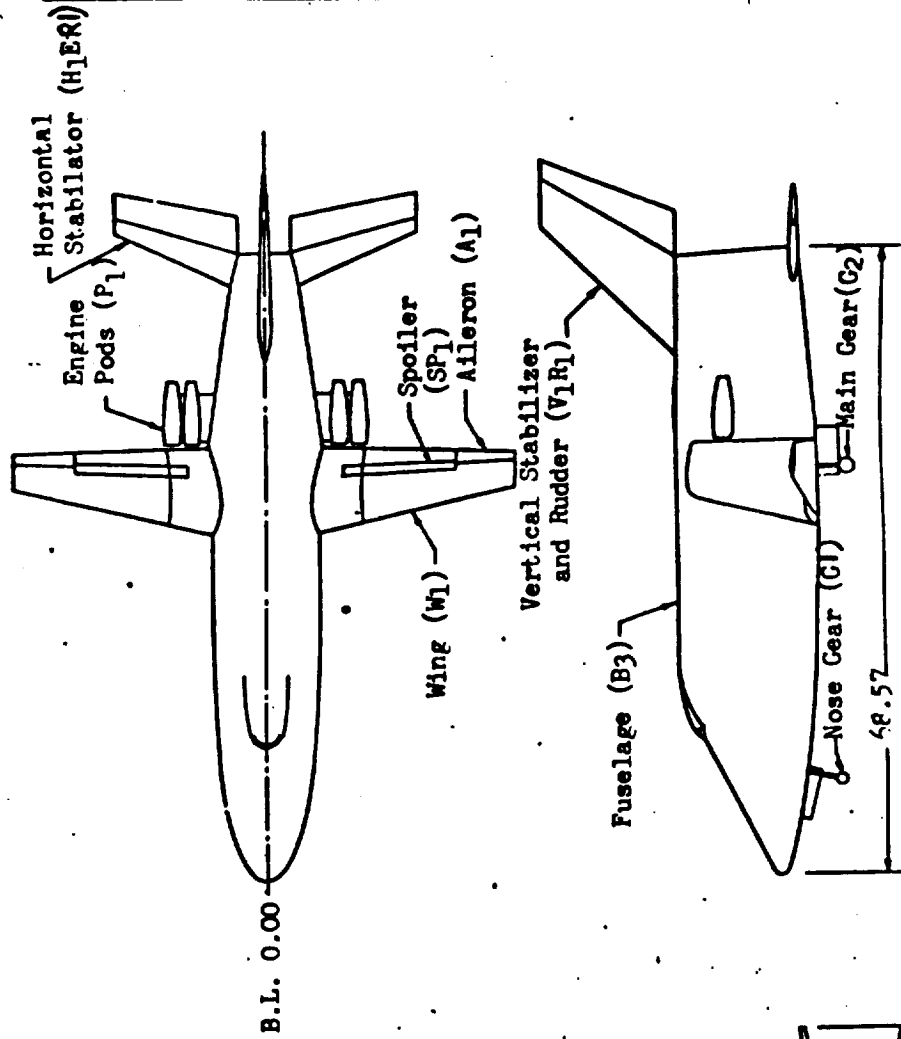
STUDENTS

28M-JAN-75AM

DATE _____
REVISED _____
BY _____

MCDONNELL
ST. LOUIS, MISSOURI

GENERAL ASSEMBLY



- NOTES:
1. All dimensions model scale in inches.
 2. Reference: McDonnell Dwg. STS-03326.

FIGURE 10. GENERAL ASSEMBLY DRAWING

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 667

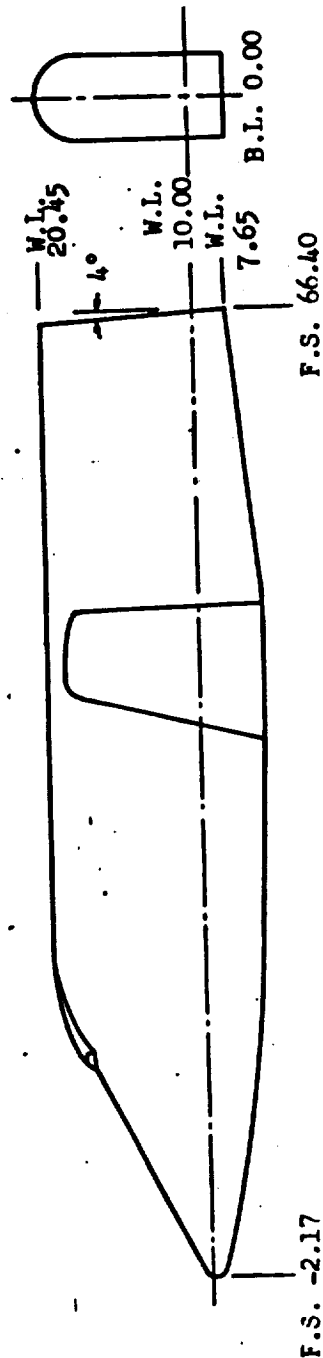
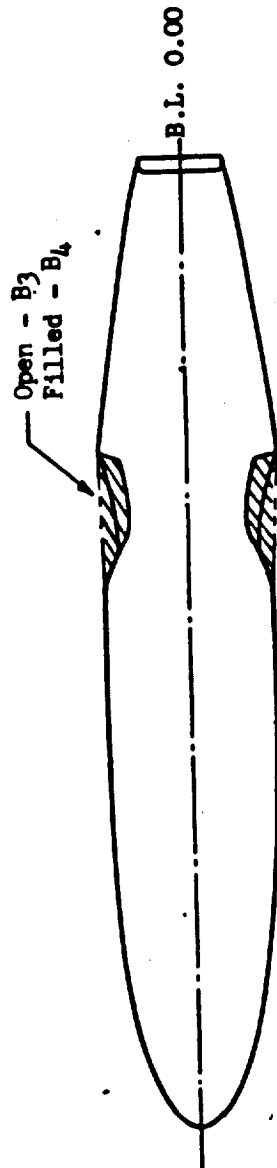
MCDONNELL

ST. LOUIS, MISSOURI

DATE _____
REVISED _____
REVISED _____

PAGE _____
REVISION _____
REVISION _____

FUSELAGE (B₃, B₄)



- NOTES: 1. All dimensions are model scale in inches.
2. Reference: McDonnell Dwg. STS-03327, STS-03328, STS-03344

FIGURE 11. DRAWING OF FUSELAGE B3 AND B4

MCDONNELL
ST. LOUIS, MISSOURI

DATE

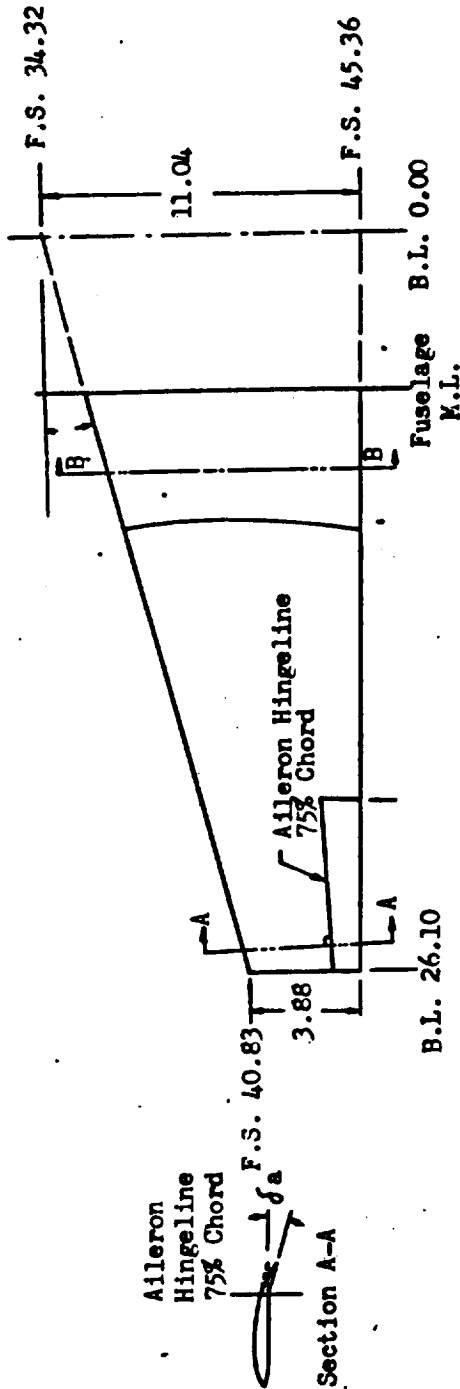
REVISED

REVISED

PAGE

REPORT

NO.



B.L. 9.73
W.L. 9.86



Section B-B

NOTES: 1. All dimensions are model scale in inches.

2. Aileron deflections are positive when left hand aileron is trailing edge down and right hand aileron is trailing edge up.
3. Left hand wing shown, right hand opposite.
4. Reference: McDonnell Dwg. STS-03331.

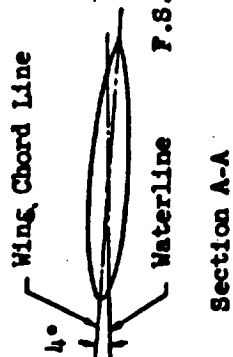
WING (W1) AND AILERON (A1)

FIGURE 12. DRAWING OF WING W1 AND AILERON A1

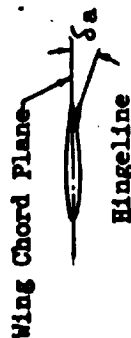
STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 669

MCDONNELL
ST. LOUIS, MISSOURI

WING (W₂) AND AILERON (A₂)



Section A-A



Section B-B



Notes:

1. All dimensions are model scale in inches.
2. Aileron deflections are positive when left hand aileron is trailing edge down and right hand aileron is trailing edge up.
3. Reference: McDonnell Dwg. STS-03342
STA-03343

ORIGINAL PAGE IS
OF POOR QUALITY

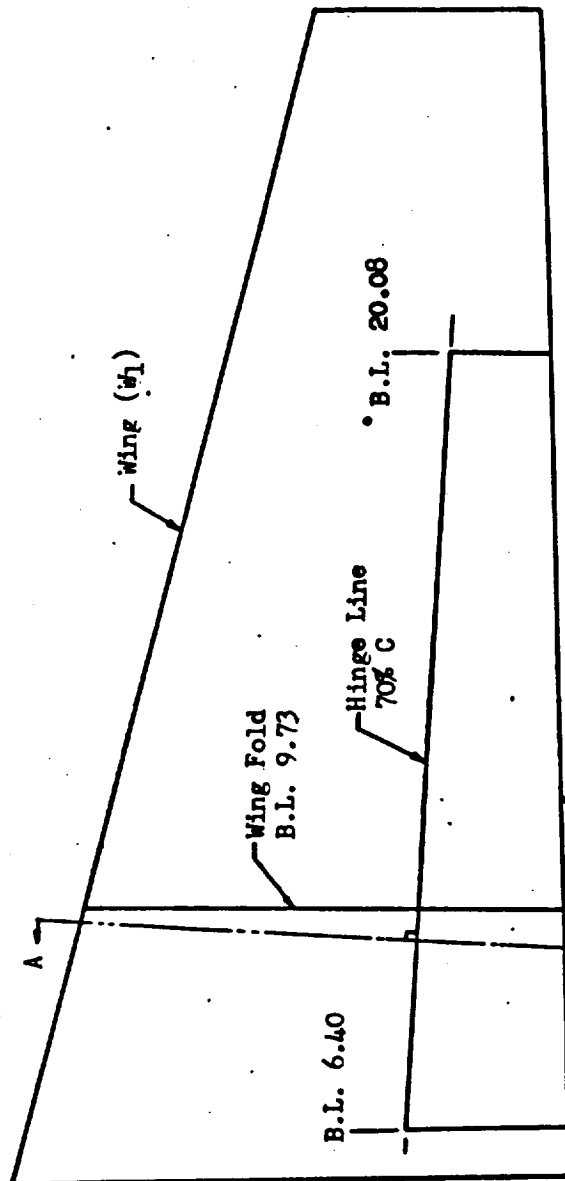
FIGURE 13. DRAWING OF WING W₂ AND AILERON A₂

DATE _____
 REVISED _____
 REVISED _____

MCDONNELL
 ST. LOUIS, MISSOURI

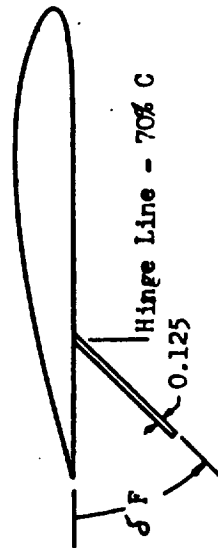
PAGE _____
 REPORT _____
 MODEL _____

WING FLAP (F₁)



Wing Flap (F₁)

- NOTE : 1. All dimensions are model scale in inches.
 2. Left hand wing shown, right hand opposite.
 3. Reference: McDonnell Dwg. STS-03332



Section A-A
 (Upright)

FIGURE 14. DRAWING OF WING FLAP F1

STRAIGHT WING ORBITER

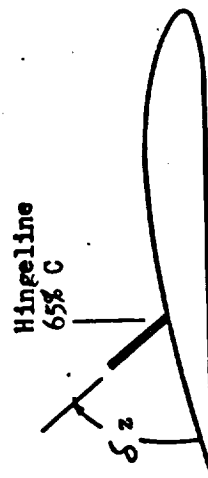
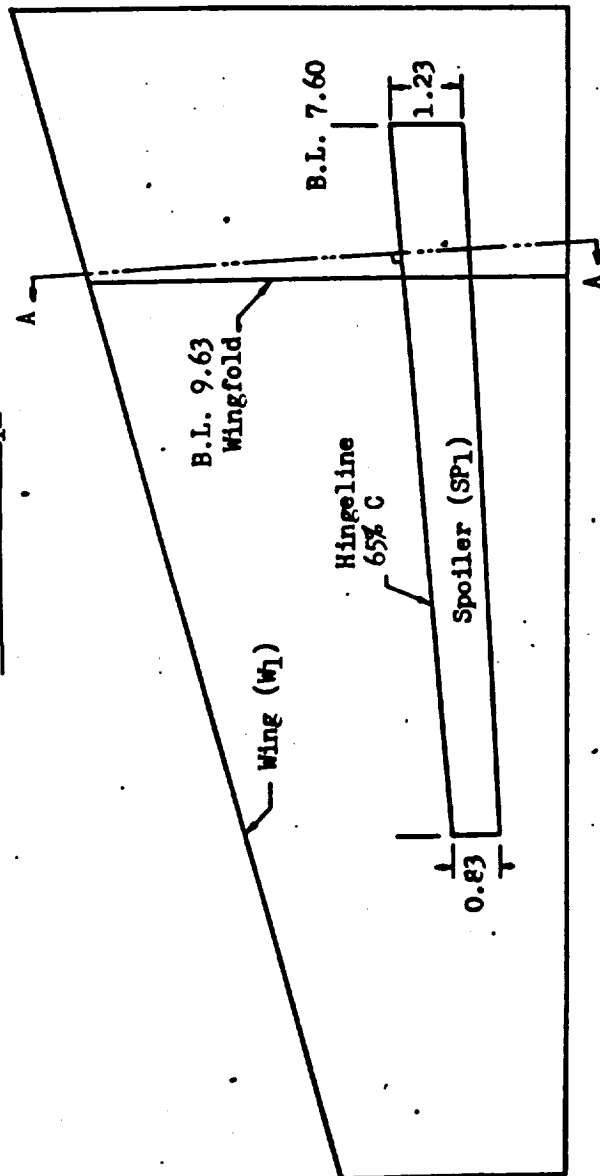
MDAC
 DR#1090 B-1- 671

MCDONNELL
ST. LOUIS, MISSOURI

DATE _____
REVISED _____
REVISED _____

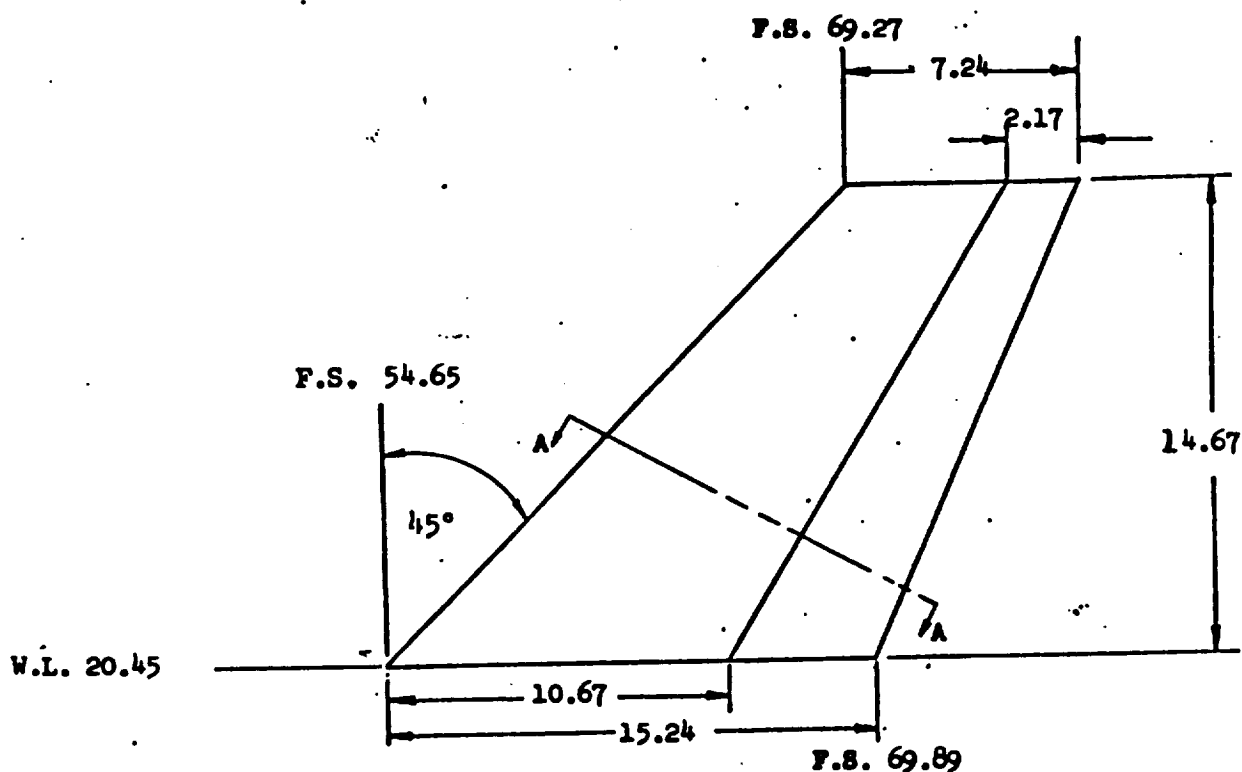
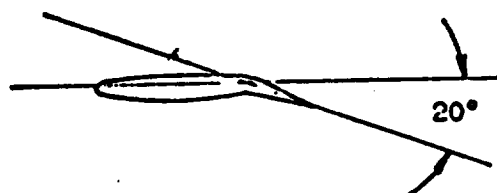
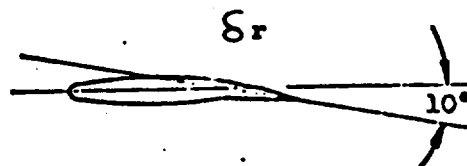
PROJECT _____
SHEET _____
TOTAL _____

WING SPOILER (SP1)



- NOTES: 1. All dimension are model scale in inches.
2. Left hand shown, right hand opposite.
3. Reference: McDonnell Dwg. STS-03332

FIGURE 15. DRAWING OF WING SPOILER SP1



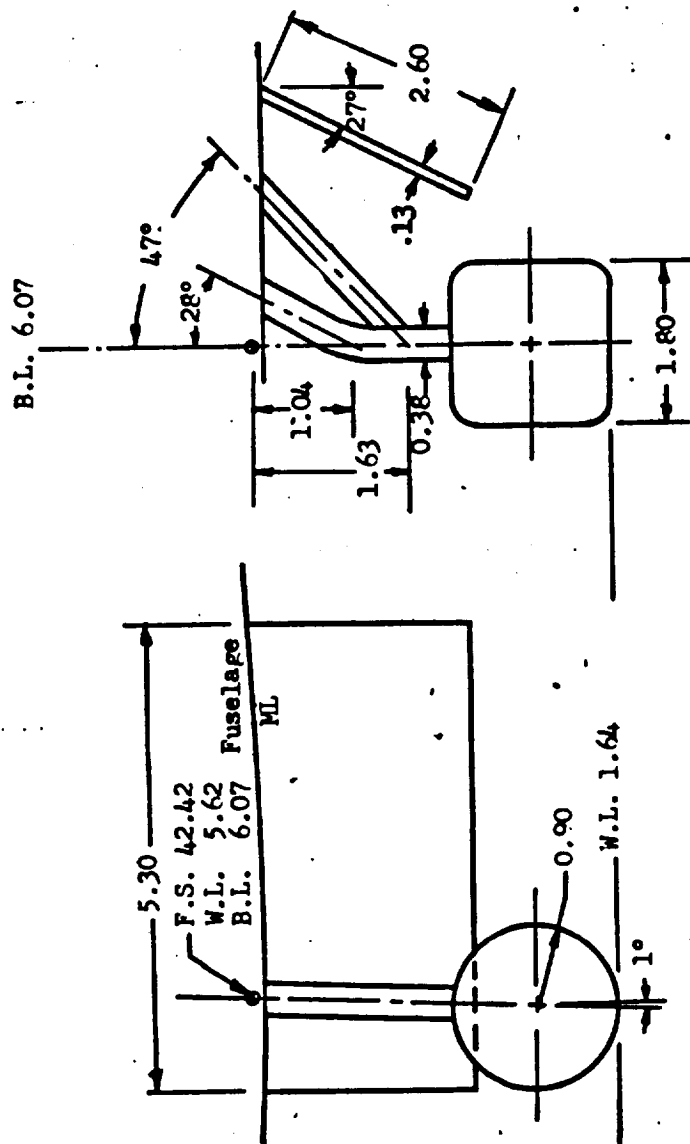
Notes:

- NOTES:
1. All dimensions are model scale in inches.
 2. Reference Dwg. No.

FIGURE 17. VERTICAL TAIL (V_1) AND RUDDER (R_1)

4.0% LOW CROSS RANGE (OL)

MAIN LANDING GEAR (G₂)



ORIGINAL PAGE IS
OF LOW QUALITY

- Notes:
1. All dimensions are model scale in inches.
 2. Left hand shown, right hand opposite.
 3. Reference: McDonnell Dwg. STS-03334

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 675

FIGURE 18. DRAWING OF MAIN LANDING GEAR G2

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 676

DESIGNED TO
STANDARD QUALITY

MCDONNELL

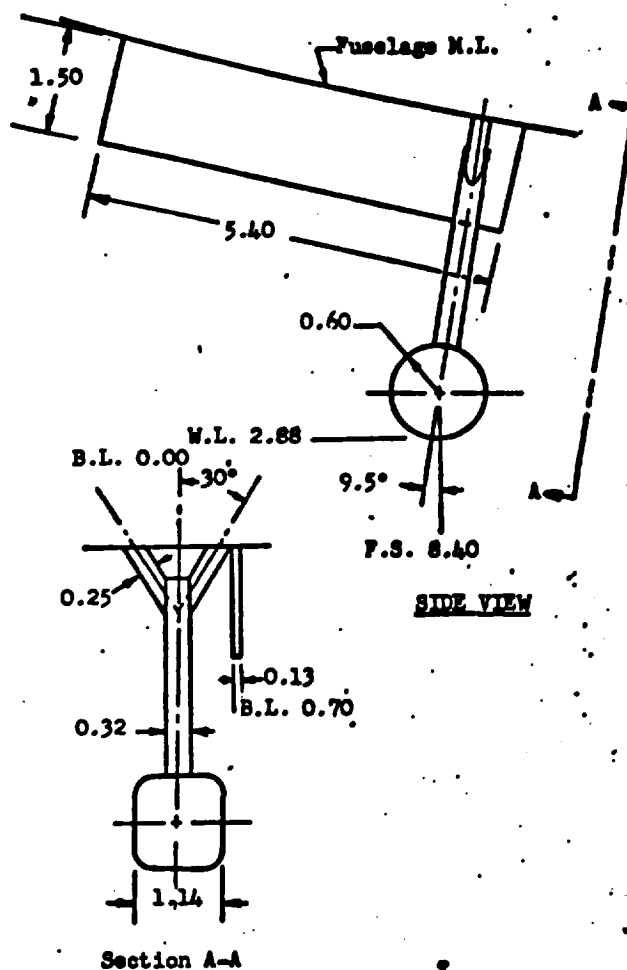
ST. LOUIS, MISSOURI

PAGE _____

REPORT _____

MODEL _____

NOSE LANDING GEAR (G₁)



- NOTES: 1. All dimensions are model scale in inches.
2. Reference: McDonnell Dwg. STS-03334.

FIGURE 19. DRAWING OF NOSE LANDING GEAR G₁

REACTION CONTROL SYSTEM POD (N₁)

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 677

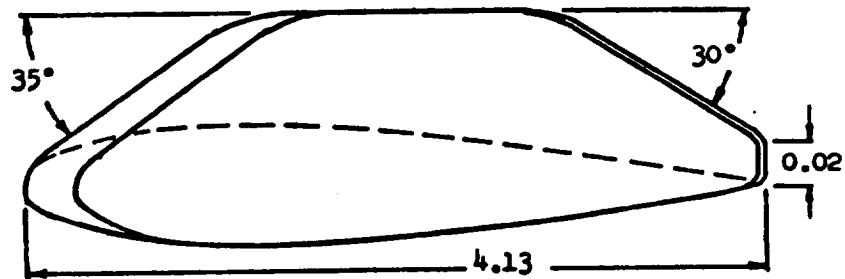
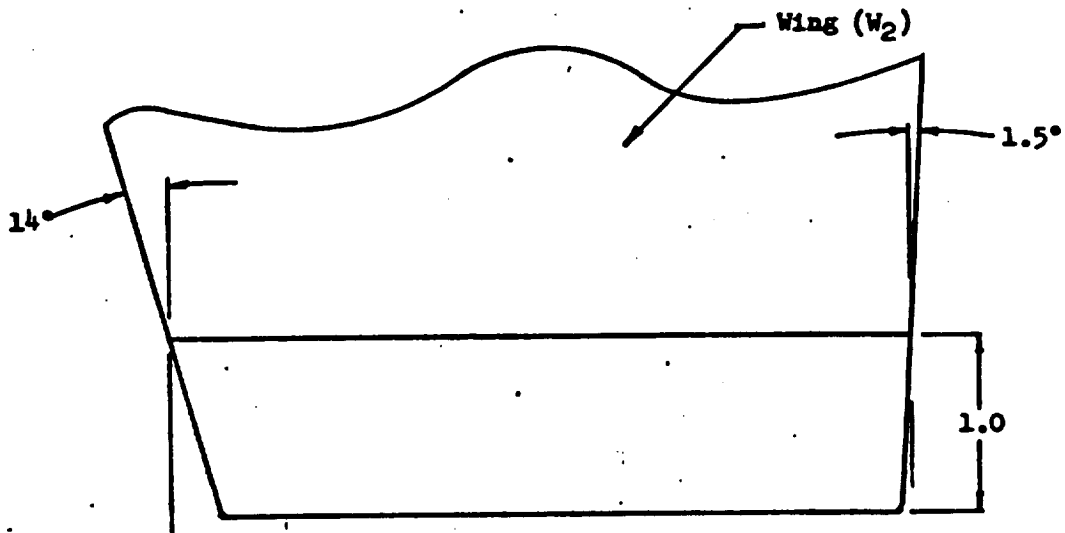


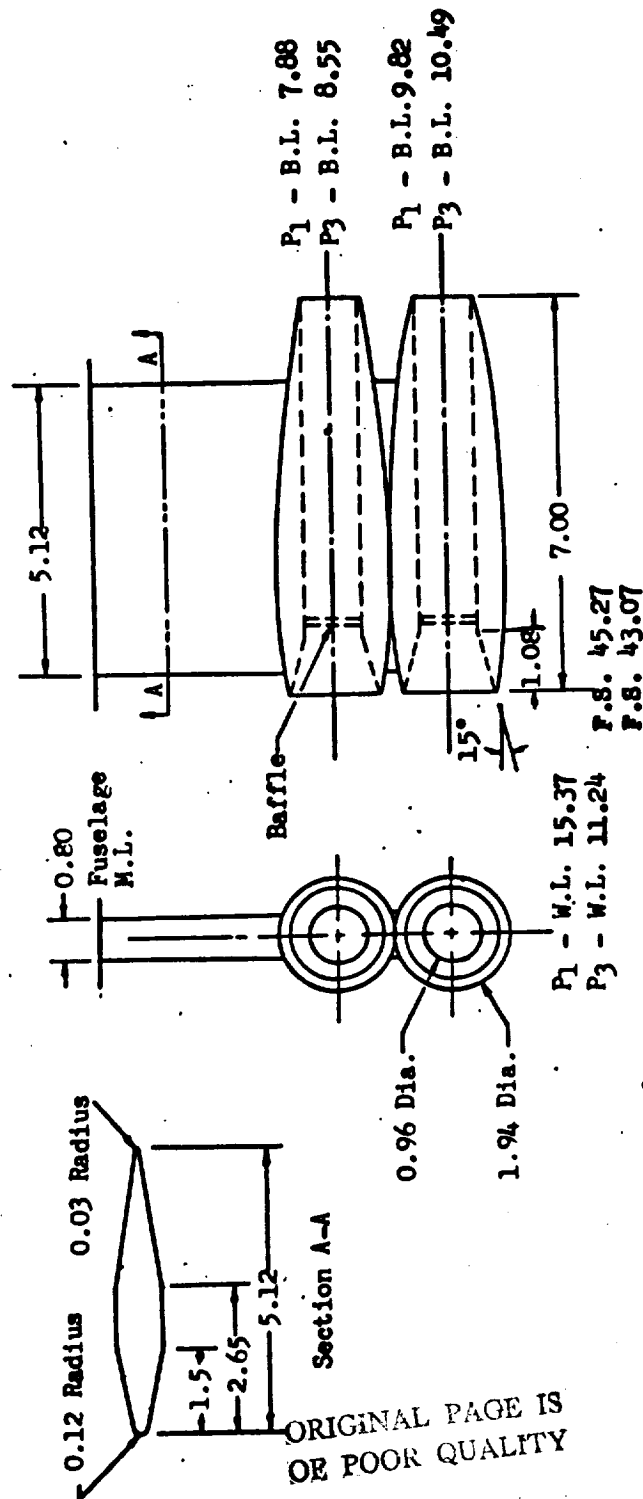
FIGURE 20. DRAWING OF REACTION CONTROL SYSTEM POD N1

MCDONNELL

OF LINES, DIMENSIONS

FLOW-THROUGH NACELLES (P₁, P₃)

View A-A



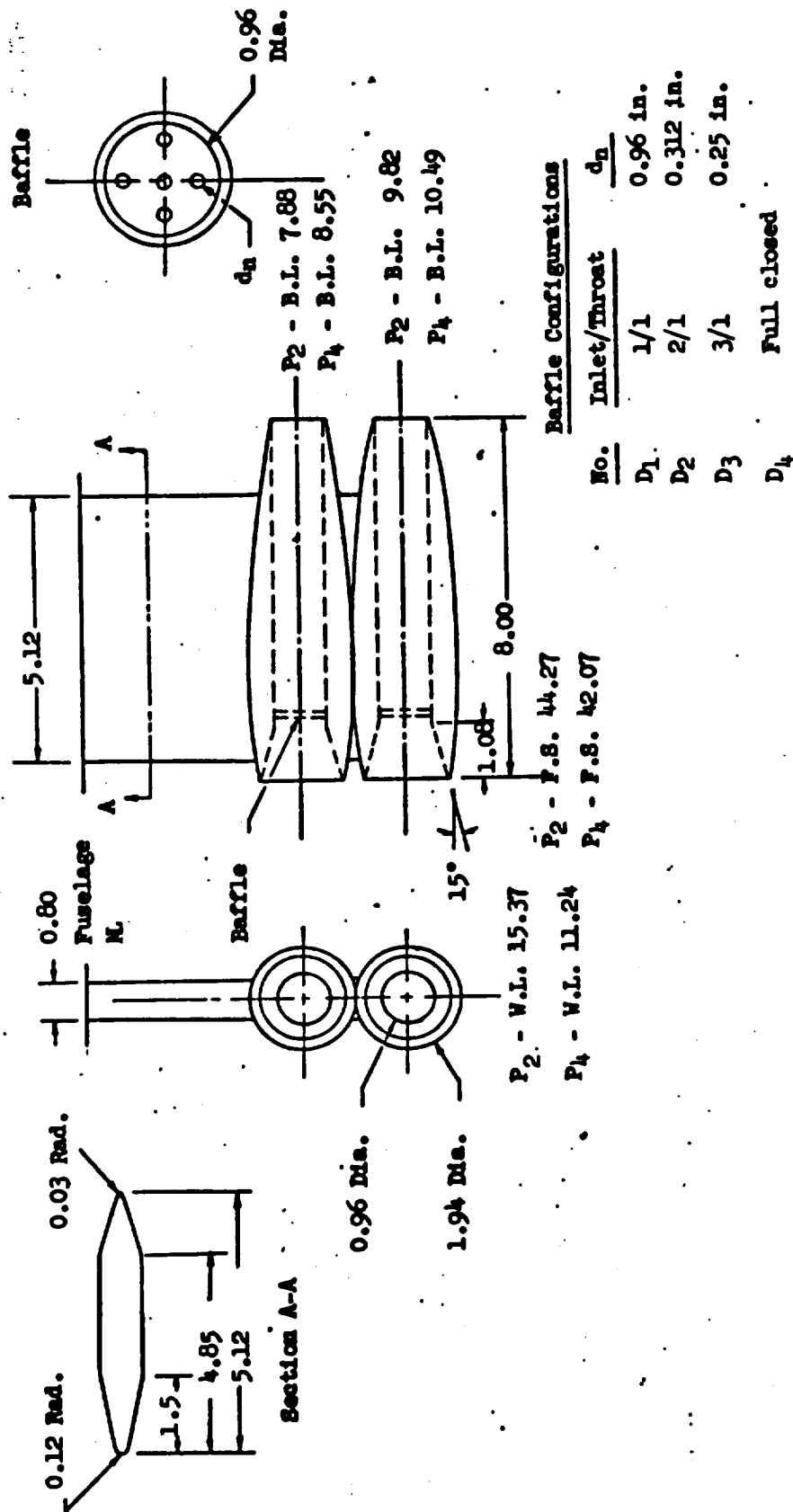
- NOTES:
1. All dimensions are model scale in inches.
 2. Left hand shown, right hand opposite.
 3. Reference: McDonnell Dwg. STS-03326
STS-03336

FIGURE 21. DRAWING OF FLOW-THROUGH NACELLES P1 AND P3

MCDONNELL

ST. LOUIS, MISSOURI

POWERED NACELLES (P₂, P₄)



STRAIGHT WING ORBITER
MDAC
DR#1090 B-1- 679

FIGURE 22. DRAWING OF POWERED NACELLES P₂ AND P₄

MCDONNELL

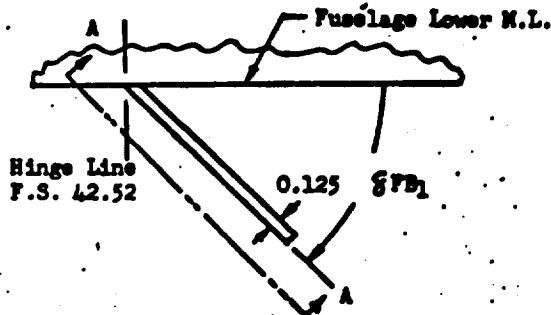
ST. LOUIS, MISSOURI

PAGE _____

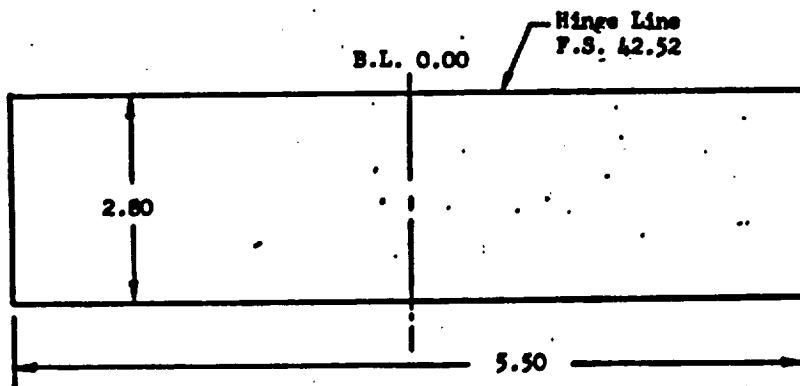
REPORT _____

MODEL _____

BODY FLAP (FB₂)



SIDE VIEW



Section A-A (Rotated 90°)

- NOTES: 1. All dimensions are model scale in inches.
2. Reference: McDonnell Dwg. STS-03332.

ORIGINAL PAGE IS
OF POOR QUALITY

FIGURE 23. DRAWING OF BODY FLAP FB₂

ORIGINAL PAGE IS
OF POOR QUALITY

MCDONNELL

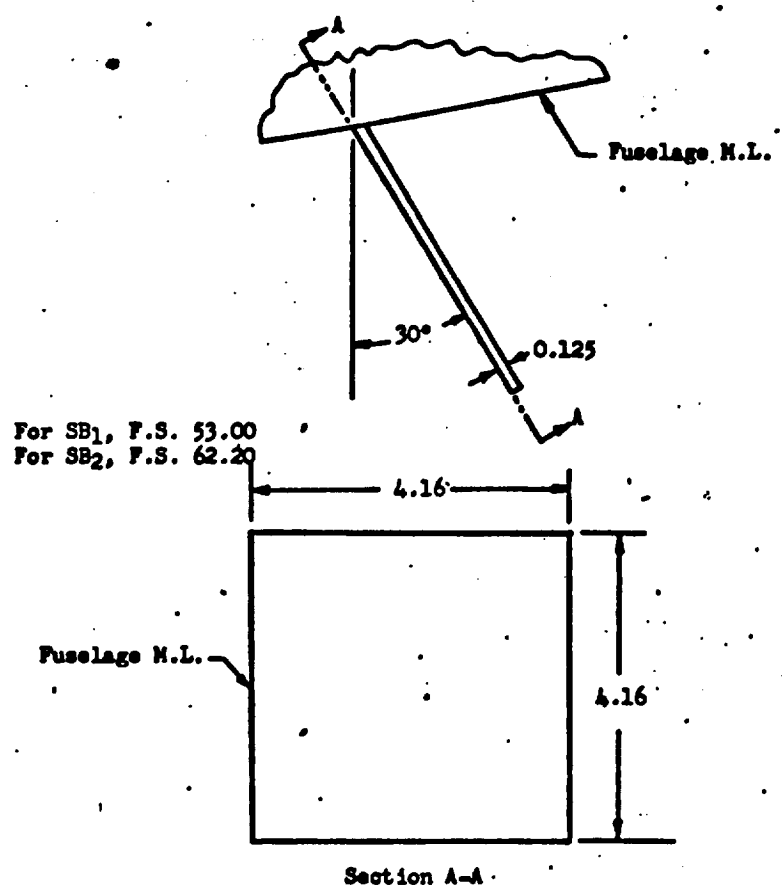
ST. LOUIS, MISSOURI

DATE _____
REVISED _____
REVISED _____

PAGE _____
REPORT _____
MODEL _____

STRAIGHT WING ORBITER
MDAC
DR#1090 B-1-681

FUSELAGE SPEED BRAKES (SB₁, SB₂)



- NOTES: 1. All dimensions are model scale in inches.
2. Left hand shown, right hand opposite.
3. Reference: McDonnell Dwg. STS-03333.

FIGURE 24. DRAWING OF FUSELAGE SPEED BRAKES SB1 AND SB2

MCDONNELL

ST. LOUIS, MISSOURI

PAGE _____

REPORT _____

MODEL _____

**BASE PRESSURE
ORIFICE LOCATIONS**

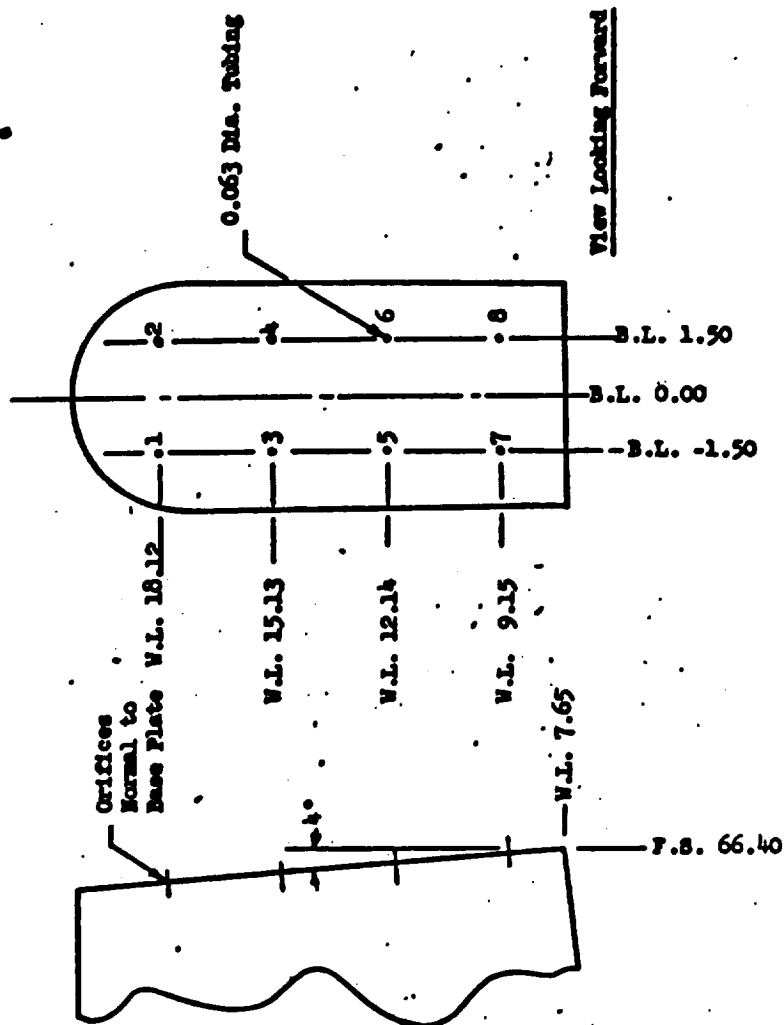


FIGURE 26. DRAWING OF BASE PRESSURE ORIFICE LOCATIONS

- Notes:**
1. All dimensions are model scale in inches.
 2. Orifice numbers correspond to data symbols P81, P82, etc.
 3. Reference: McDonnell Dev. STS-03340

Ames 3.5' TEST 78

DATA SET COLLATION SHEET

Ames 3.5' TEST 78

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	RUN #	MACH NUMBER = 7.4									
		A	B	δe	δe	δe												
RA6011	BI	A	0	OFF			1	15										
RA6012	BI	B					1	40										
RA6013	BI	C					1	18										
RA6014	BI	D					1	45										
RA6021	BIV3	A					1	14										
RA6031	BIW2V3	A					1	17										
RA6041	BIW2	A					1	16										
RA6042	BIW2	B					1	47										
RA6043	BIW2	C					1	23										
RA6044	BIW2	D					1	40										
RA6051	BIHGE20	A				+20°	1	12										
RA6052	BIHGE20	B					1	53										
RA6053	BIHGE20	C					1	20										
RA6054	BIHGE20	D					1	44										
RA6061	BIHGE0	A				0°	1	11										
RA6062	BIHGE0	B					1	54										
RA6063	BIHGE0	C					1	19										
RA6064	BIHGE0	D					1	41										
RA6071	BIHGE-20	A				-20°	1	13										
RA6072	BIHGE-20	B					1	55										

30

COEFFICIENTS:		CN	CAT	OTL	CNM	CY	CYM	CRL
A		0.2	4.5	7.9	11.3	15.17	19°	GRADIENTS 7.0/13.0°
B		30.32	34.34	40.42	44.46	48.49°		31.0/43.0°
C		50.52	54.56	58.60	62.64	66.68	69°	57.0/63.0°
D		70.72	74.76	78.80	82.84	86.88	89°	77.0/83.0°

α or β
SCHEDULES

STRAIGHT WING ORBITER
MSC
DR#1002 B-1- 683

AMES 3.5' TEST 78 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS = 7.4									
		a	b	a	b		21	22	23	24	25	26	27	28	29	30
073	B1H6 E-20	C	0	-20		1										
074	↓	D		↓		1	42									
082	B1H6 E-40	B		-40		1	56									
083	↓	C		↓		1	22									
084	↓	D		↓		1	43									
082	B1W2 H6 E-40	B		-40		1	50									
093	B1W2V3H6 E-40	C		↓		1	28									
094	↓	D		↓		1	39									
103	B1W2V3H6 E-30	C		-30		1	27									
104	↓	D		↓		1	58									
111	B1W2V3H6 E-20	A		-20		1	6									
212	B1W2 H6 E-20	B		↓		1	49									
113	B1W2V3H6 E-20	C		↓		1	26									
114	↓	D		↓		1	37									
121	B1W2V3H6 E-10	A		-10		1	8									
123	↓	C		↓		1	25									
124	↓	D		↓		1	36									
131	B1W2V3H6 EO	A		0		1	7									
192	B1W2 H6 EO	B		↓		1	48									
133	B1W2V3H6 EO	C		↓		1	24									

COEFFICIENTS:	a or b	SCHEDULES	MACH NUMBERS = 7.4									
			1	2	3	4	5	6	7	8	9	10
A	0	2	4	5	7	9	11	13	15	17	18	19
B	30	32	33	34	35	36	37	38	39	40	41	42
C	50	52	53	54	55	56	57	58	59	60	61	62
D	170	172	173	174	175	176	177	178	179	180	181	182

AXELSON
3/4

AMES 3.5' TEST 78 DATA SET COLLATION SHEET

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS = 7.4									
		a	B	a	B		1	2	3	4	5	6	7	8	9	10
RAG 134	BIW2V3H6E0	D	0	0	0	1	35									
143	BIW2V3H6E10	C	1	10			29									
151	BIW2V3H6E20	A		20			9									
222	BIW2H6E20	B					51									
153	BIW2V3H6E20	C					30									
154	Y	D					34									
163	BIW2V3H6E30	C		30			31									
171	BIW2V3H6E40	A		40			10									
232	BIW2H6E40	B					52									
173	BIW2V3H6E40	C					32									
174	↓	D					33									
016	BI	0°	F	OFF			79									
017	↓	30°					57									
018	↓	50°					66									
019	↓	70°					68									
026	BIV3	0°					78									
028	↓	50°					65									
029	↓	70°					69									
038	BIW2V3	50°					67									
039	↓	70°					70									

COEFFICIENTS:		CN	CAT	TOTL	CNM	CY	CYM	CRL	GRADIENTS																																																																																				
A	0	2	4	5	7	7	11	13	15	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
B	30	34	36	38	40	42	44	46	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																
C	50	52	54	56	58	60	62	64	66	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																			
D	70	72	74	76	78	80	82	84	86	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																							

STRAIGHT WING ORB MSC

0.34%

STRAIGHT WING ORBITER
MSC
DR#1002 B-1-685

AMES 3.5' TEST 78 DATA SET COLLATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.			CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS = 7.4											
		a	B	δ_e					RUV											
189	BIW2HGE-40	70°	F	-40				/	72											
196	BIW2HGE0	0°		0					75											
197		30°							59											
198		50°							61											
207	BIW2HGE0+Abzzies	30°							60											
136	BIW2V3HGE0	0°							76											
138		50°							62											
116	BIW2V3HGE-20	0°		-20°					77											
118		50°							63											
099	BIW2V3HGE-40	70°		-40°					71											
046	BIW2	0°		OFF					74											
047		30°							58											
048		50°							64											
049		70°							73											

COEFFICIENTS:

CN CATOTLCNM CY CYM CRL

F 0,1,2,4,6,8,10,12,14,16 GRAVENTS 0.374,0°

a or B
SCHEDULES

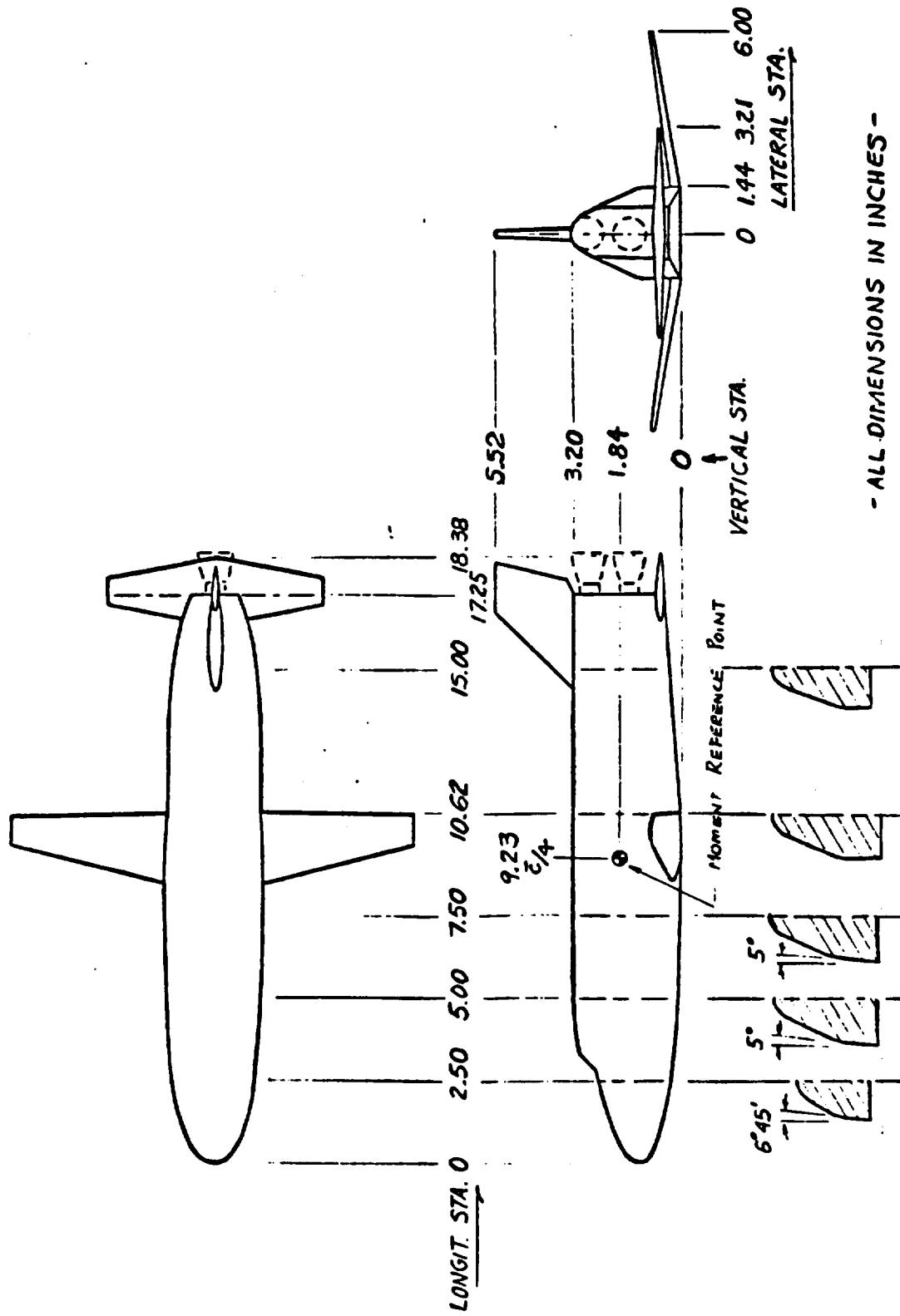


FIGURE 2. ASSEMBLY DRAWING OF MSC ORBITER S-3

STRAIGHT WING ORBITER
MSC
DR#1002 B-1- 687

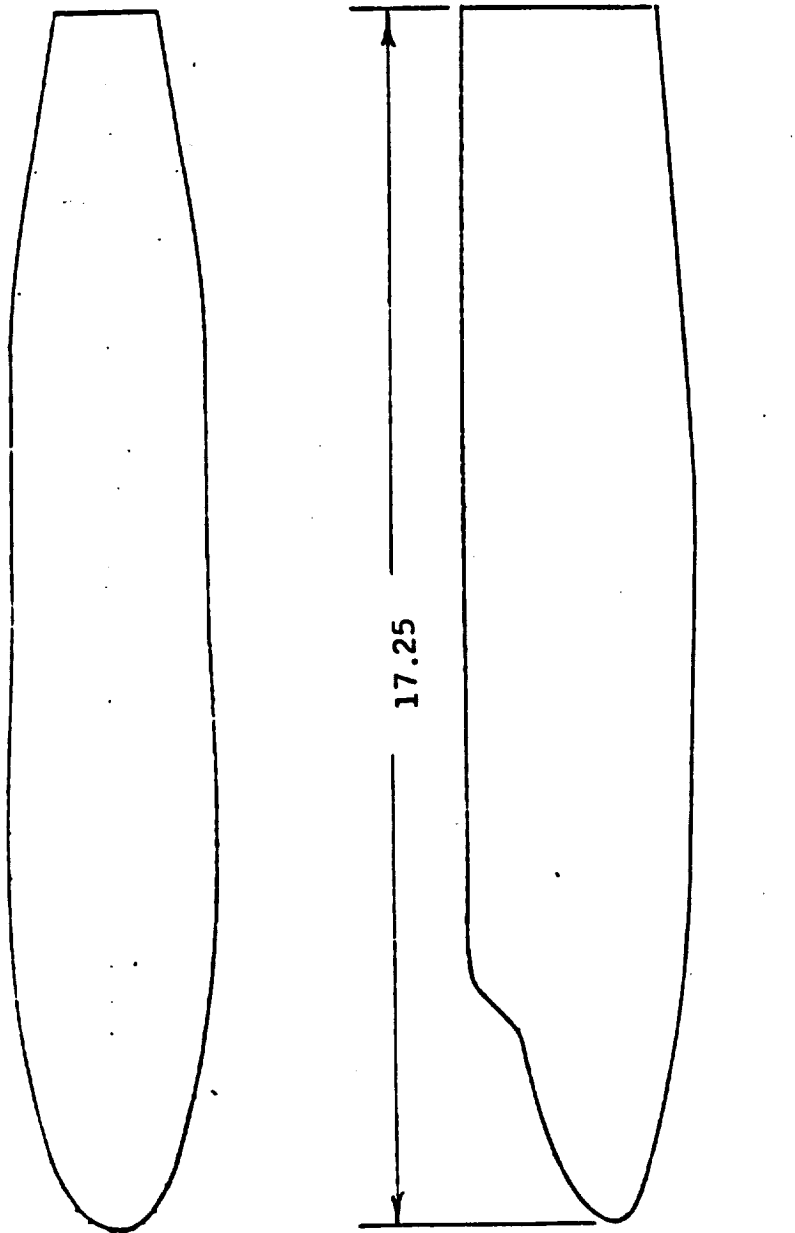


FIGURE 3. Fuselage (B₁).
(Drawing number SDY37100095).

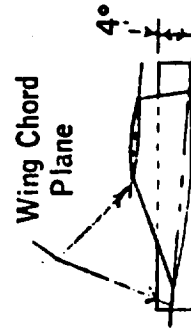
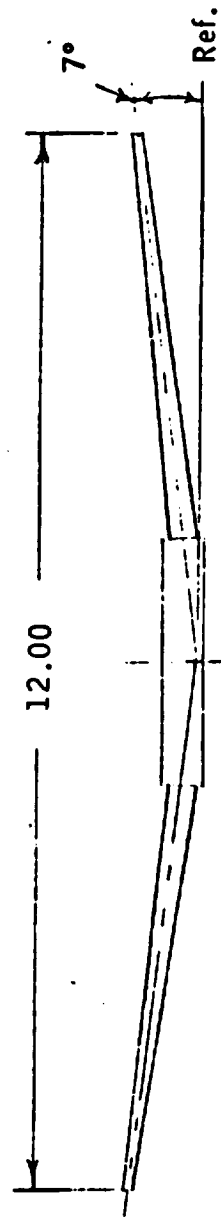
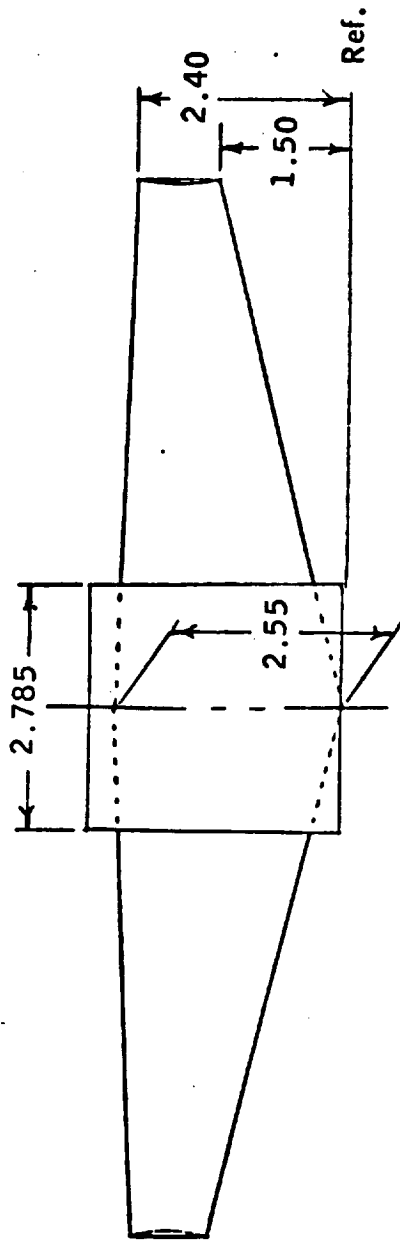
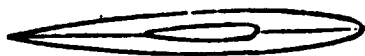


FIGURE 4. Wing component (W₂).
(Drawing number SGY37100102)



792

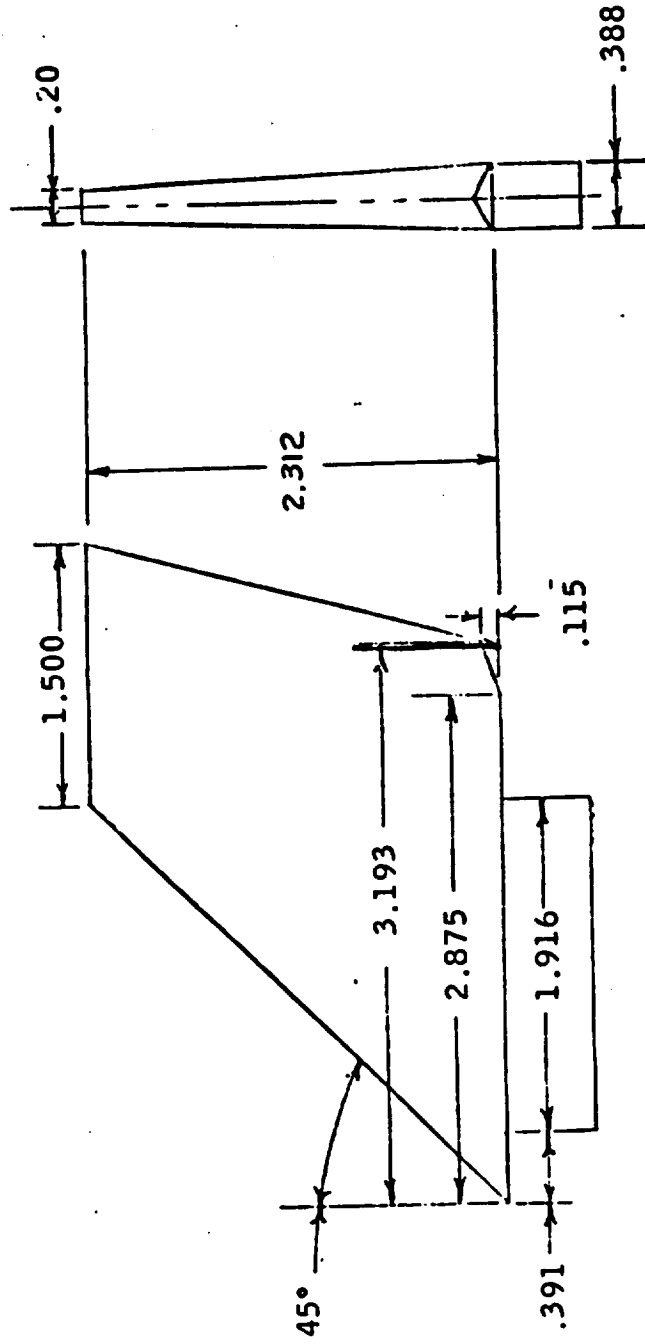


FIGURE 6. Vertical stabilizer (V₃).
(Drawing number SGY37100098)

STRAIGHT WING ORBITER
MSC
DR#1002 B-1- 691

TEST OBJECTIVE: Force Test Houston Concept

Aug., 1969 Rev., Body Build-up and Control Evaluation

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		a	B	(1)	2		6.0									
RL1121	BIV3W2H6R	A	0	0	-40	1	12									
RL1132	↓	A	-5		↓		13									
RL1133	↓	B	-2		↓		130									
RL1141	BIV3W2H6 OFF	A	0		—		14									
RL1152	↓	A	-5		—		15									
RL1163	↓	B	-2		—		16									
RL1171	BIV3W2	A	0		—		17									
RL1182	↓	A	-5		—		18									
RL1193	↓	B	-2		—		19									
RL1241	BIV3	A	0		—		24									
RL1252	↓	A	-5		—		25									
RL1263	↓	B	-2		—		26									
RL1271	BIV3H6	A	0		0		27									
RL1282	↓	A	-5		↓		28									
RL1293	↓	B	-2		↓		29									
RL1331	BIV3W2H6	A	0		0		33									
RL1342	↓	A	-5		↓		34									
RL1353	↓	B	-2		↓		35									
BETA 1 Q (PSI)		CN		CAFORE, CNM		CRL	CYM	ICY	MACH ALPHA							
COEFFICIENTS									IDPVAR (1) IDPVAR (2)							

(1) String arrangement

0 Straight string

60 60° bent string

ALPHA Schedule: A -5, 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 54.2

B 0, 54.2

C 26, 30, 35, 40, 45, 50, 55, 60

D 26, 60

a or B
SCHEDULES

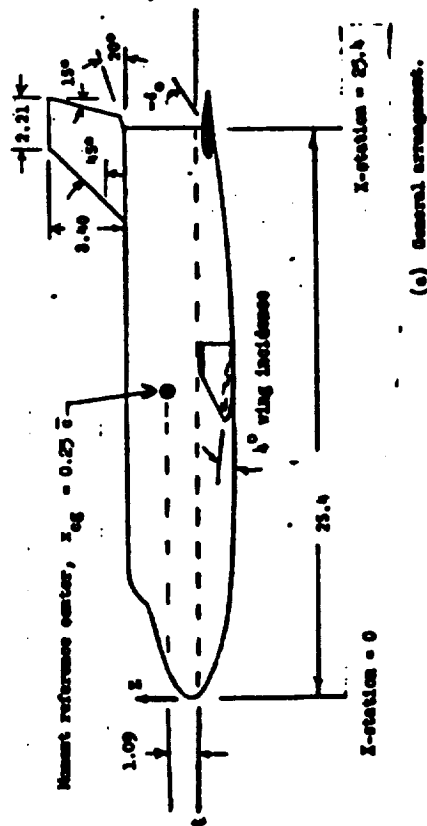
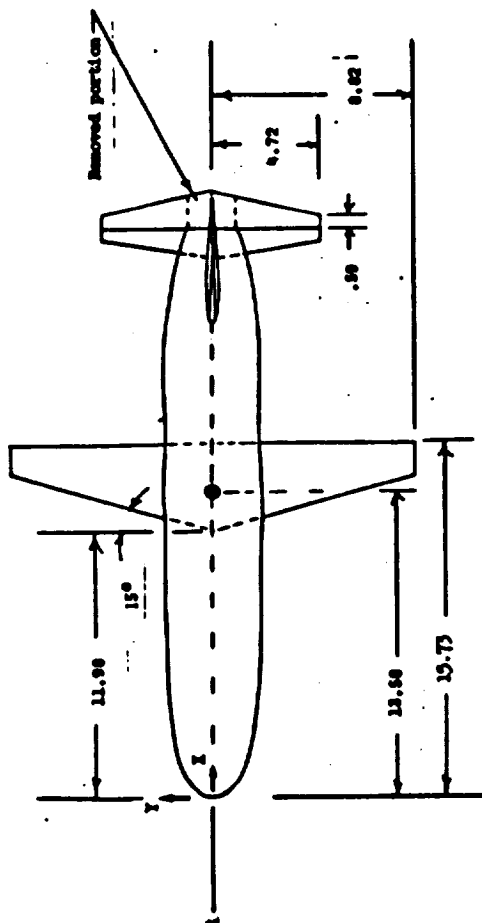
a or b
SCHEDULES

795

HORIZONTAL TAIL - 0012 - 64	
ξ Root c = 2.98	Tip c = 1.05
x/c	y/a
.10	.04
.40	.06
.80	.03
1.00	.001
L.E.R. = .06	
L.E.R. = .02	

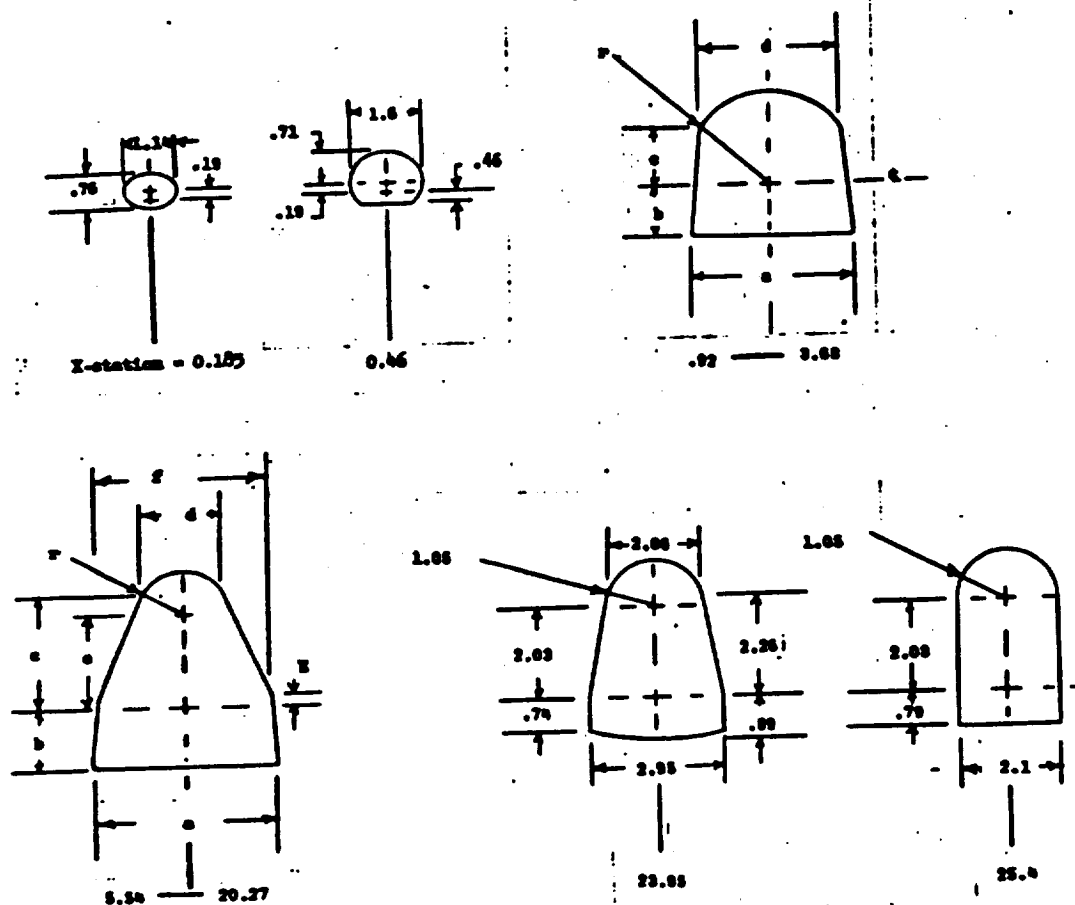
VERTICAL TAIL - 0012 - 64	
$z = 1.24$	$z = 6.48$
$c = 6.12$	$c = 2.21$
x/c	y/c
.10	.04
.40	.06
.80	.03
1.00	.001
L.E.R. = .11	
L.E.R. = .04	

WING	
0014 - 64 ROOT	0010-64 TIP
ξ ROOT c = 3.75	TIP c = 1.33
x/c	y/c
.15	.04
.30	.07
.45	.13
.60	.05
.75	.01
1.00	.002
L.E.R. = .06	
L.E.R. = .02	



NOTE : ALL LINEAR DIMENSIONS ARE IN CENTIMETERS

FIGURE 2. DETAILS OF MODEL



Station	a	b	c	d	e	f	g	h
0.92	2.22	.46	.64	1.93				1.14
1.05	2.79	.73	1.02	2.11				1.47
2.78	3.25	.97	1.12	2.62				1.78
3.68	3.54	1.14	1.27	3.05				2.03
5.54	3.91	1.37	2.41	1.75	2.03	3.68	.25	.99
7.37	4.06	1.43	2.43	1.91	2.03	3.81	.25	1.05
11.05	4.19	1.52	2.49	1.91	2.03	3.94	.29	1.05
13.82	4.15	1.53	2.45	1.91	2.03	3.94	.29	1.05
15.55	3.94	1.52	2.48	1.91	2.03	3.94	.29	1.05
20.27	3.94	1.21	2.48	1.91	2.03	3.94	.29	1.05

NOTE: ALL LINEAR DIMENSIONS ARE IN CENTIMETERS

FIGURE 2. (CONTINUED)

TEST LSWT 223 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS			
		a	B	Lt	de	φ		.17	.25		
RCIEGO	BIH6V3W1	A	0	0	0	0	F	1	1		
01			5					2	2		
02		B	0	-5				1	4		
03				-10					5		
04		C		0	10				12		
05					-10				13		
06					20				15		
07					30				18		
08		D			0			31			
09								81			
10		C							82		
11		O	AA		-90				83		
12		5							84		
13		8							85		
14		12							86		
15		20							87		
16		10							88		
17		E	0		90			92			
RCIF18	BIH6V3W1		-5					93			

COEFFICIENTS:

α: A = -30 AS → -10 AS → 20 AS → 90; B = -10 AS → 20
 C = -10 AS → 20 AS → 40; D = -10 AS → 90
 E = -10 AS → 90
 β: AA = 10 AS → 4 AS → -4 AS → -10

α or β
SCHEDULES

NDV

Page 1 of 5

798

TEST LSWT 223 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				No. of RUNS	MACH NUMBERS					
		α	β	i_t	δe	ϕ	$\delta \phi$		.17	.25				
RC1A00	BIH6V3W1	B	0	10	0	0	A	1		6				
01				-5						7				
02		C	1	0						8				
03			5		Y					9				
RC1A04				Y	10					11				
RC1040	BN3W1	0	OFF	OFF						10				
41		Y					F			35				
RC1042		D							36					
RC1070	BIH12V3W1	C		0	0					14				
71					10					16				
72					-10					17				
73					-20					19				
74					20					20				
75					-20					29				
RC1076		Y			20		Y			30				
RC1060	BIH1513V3	D			-20		OFF			61				
61		C	Y		20					66				
62					0					67				
63		5								68				
RC1064		Y	0	Y	10	Y	Y	Y	69					

1	7	13	19	25	31	37	43	49	55	61
---	---	----	----	----	----	----	----	----	----	----

COEFFICIENTS:

α OF β
 SCHEDULES

STRAIGHT WING ORBITER
 Page 2 of MSC
 DR#1007 B-1- 697

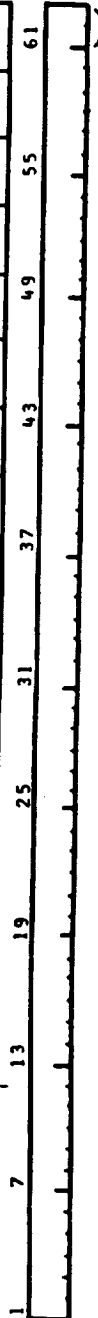
TEST LSWT 223 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS				
		α	β	δ_e	δ	δ_{ref}		.17	.25			
RC1H00	BIH513V3W1	C	0	0	2	0	F	1				
01		D							22			
02			5						23			
03		C							24			
04			10						25			
05			0		10				32			
06		D						33				
07				20				37				
08		C							38			
09				0					41			
10		D						42				
11		C		-20					48			
12		D						49				
13			5		-40			73				
RC1H14		C							74			
RC1030	BIH6V3	D	0	0	0	0=F		43				
31		C							44			
32			5						45			
33		D						46				
RC1034		C	10					47				

COEFFICIENTS:



α or β
SCHEDULES

Page 3 of 5

NDV

800

☐ PRETEST ☒ POSTTEST

ORIGINAL PAGE IS
OF POOR QUALITY

[illegible]

COEFFICIENTS:

**α or β
SCHEDULES**

STRAIGHT WING ORBITER MSC

PAGE 4 OF 5 DR#1007 B-1- 699

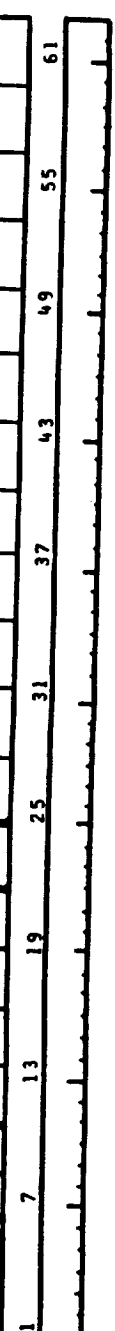
801

TEST LSWT 223 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS				
		α	β	δ	ϵ	ϕ	ψ		.17	.25			
RC1020	B1H6	C	10	0	0	0	OFF	1		56			
21			5							57			
22		D							58				
23			0						59				
24		C								60			
RC1000	B1	D		OFF	OFF				62				
01		C								63			
02			5					2		64			
RC1003		D						1	80				
RC1080	B1S1V3W1	B	0	OFF	OFF	F			70				
81	B1H1S13S1V3W1			0	0				71				
82			5						72				
83	B1H6S2V3W1	E	0			90			94				
RC1084	B1H6S3V3W1								95				

COEFFICIENTS:



α or β
SCHEDULES

NDV

PAGE 5 OF 5

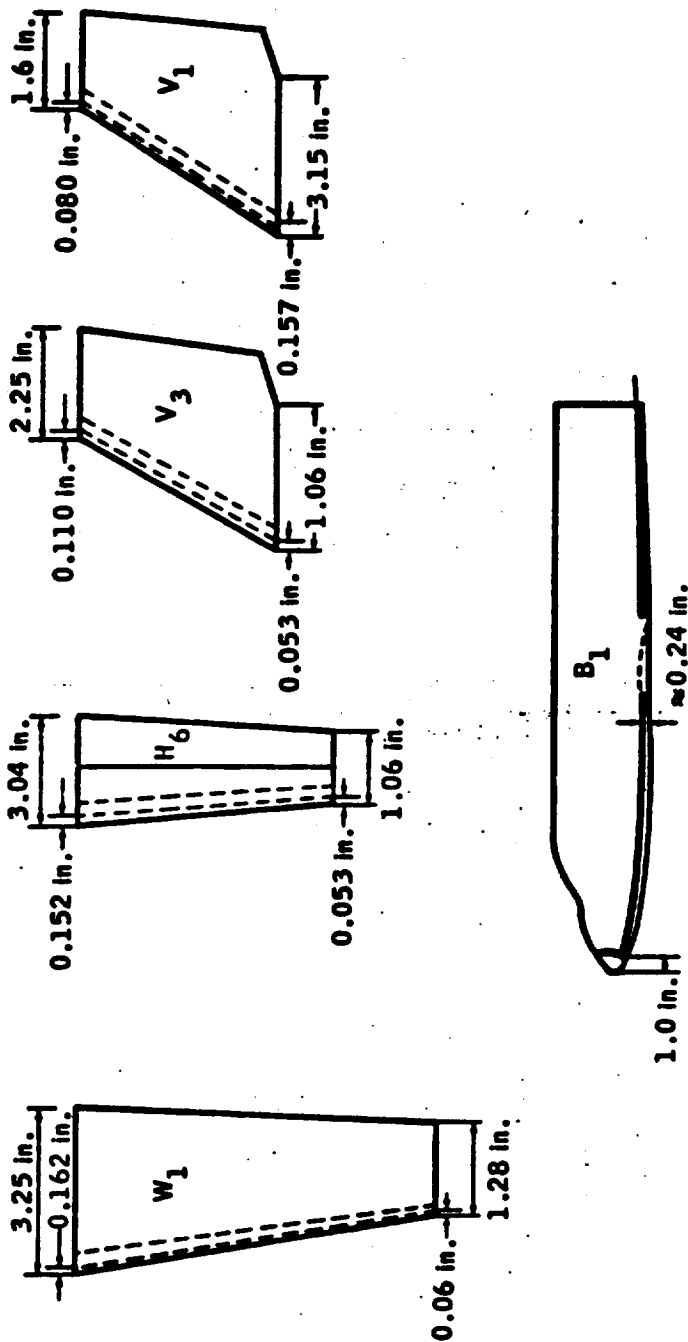


FIGURE 3. GRIT STRIPPING

ORIGINAL PAGE IS
OF POOR QUALITY

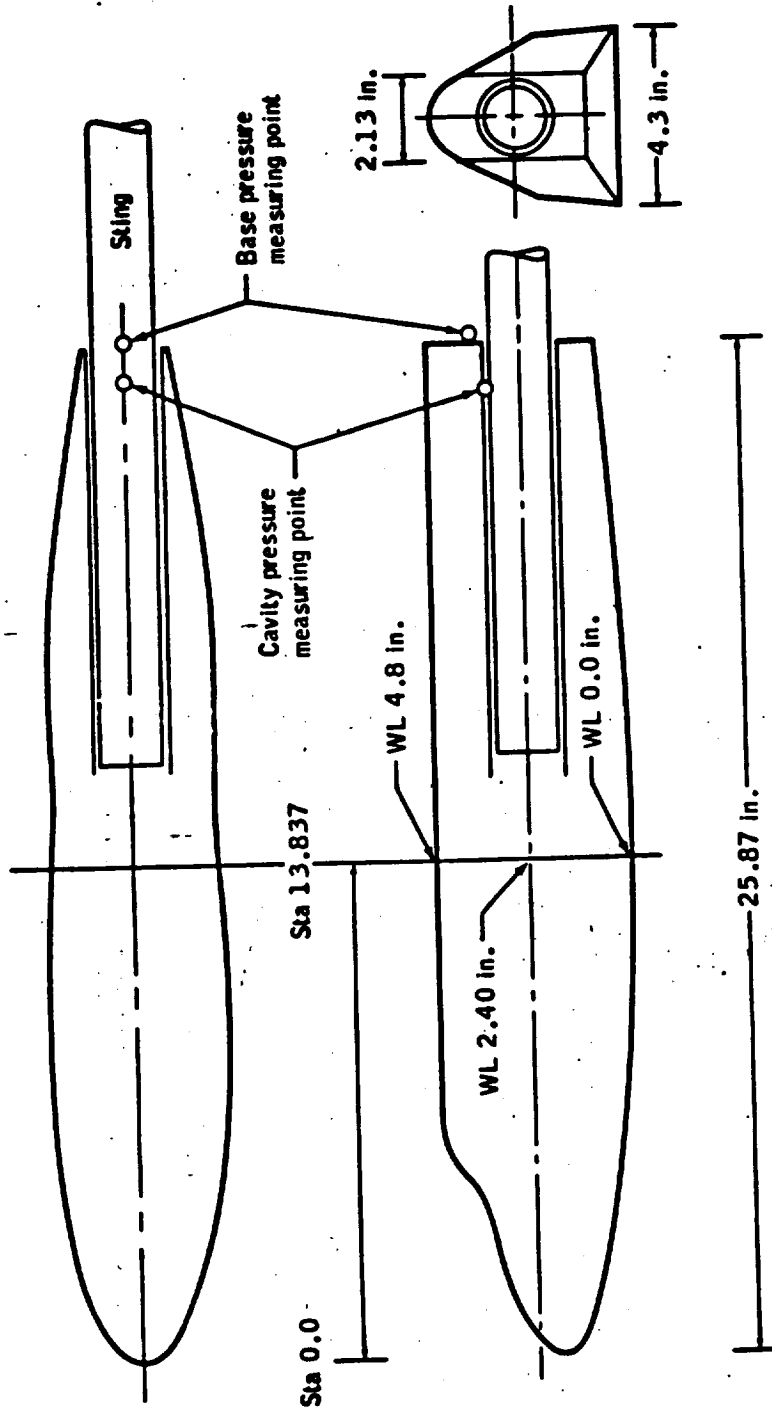


FIGURE 4. FUSELAGE B1

STRAIGHT WING ORBITER
MSC
DR#1007 8-1-703

STRAIGHT WING ORBITER
 MSC
 DR#1007 B-1- 704

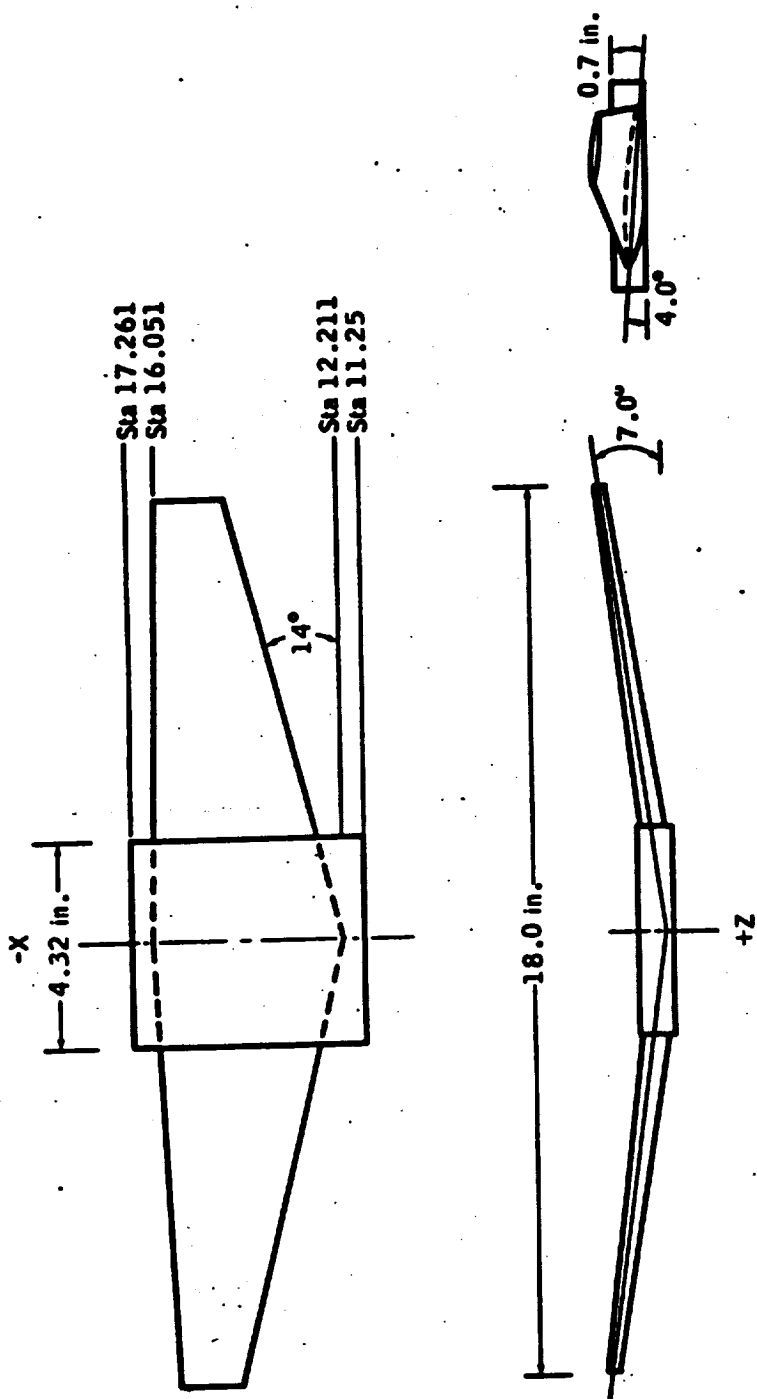
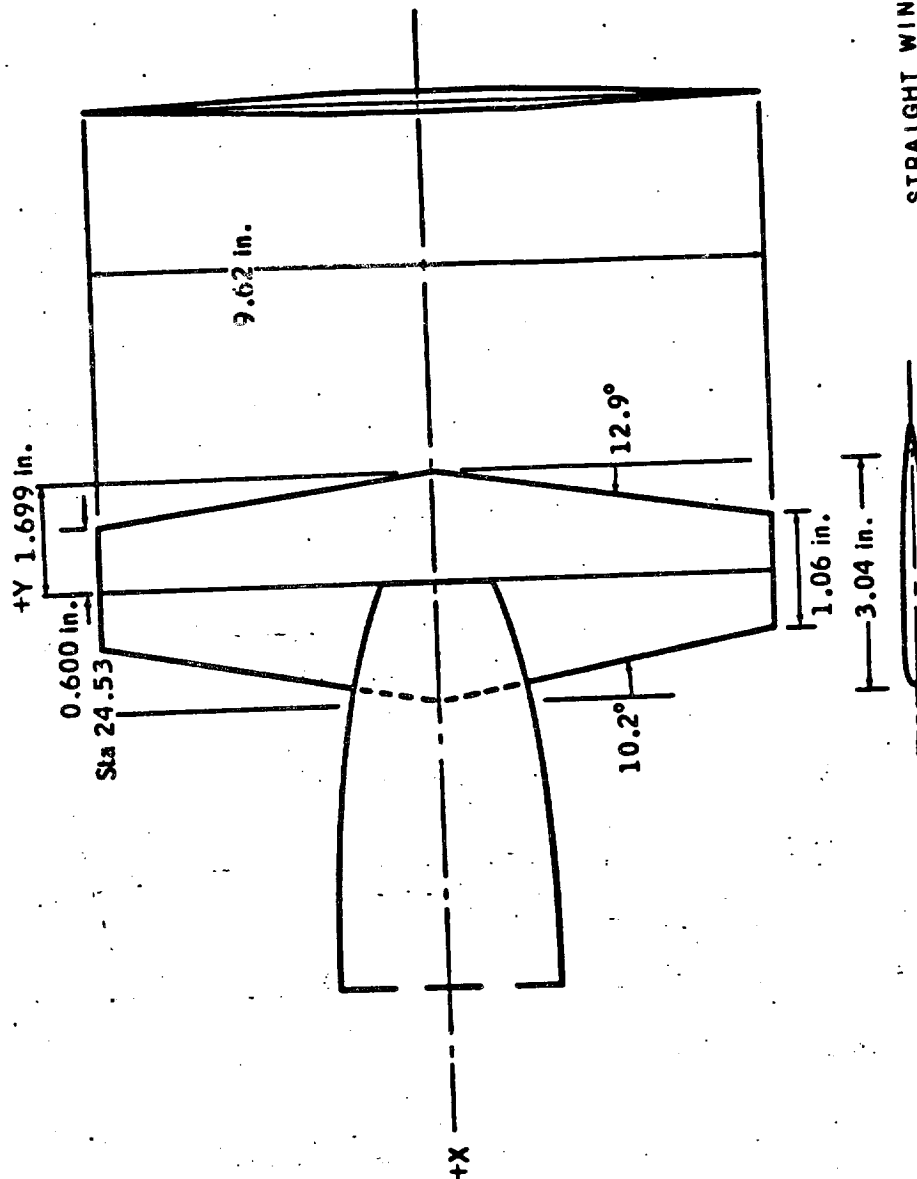


FIGURE 5. WING W1



STRAIGHT WING ORBITER
MSC
DR#1007 B-1- 705

807

FIGURE 6. HORIZONTAL STABILIZER H6

ORIGINAL PAGE IS
OF POOR QUALITY

STRAIGHT WING ORBITER
MSC
DR#1007 B-1- 706

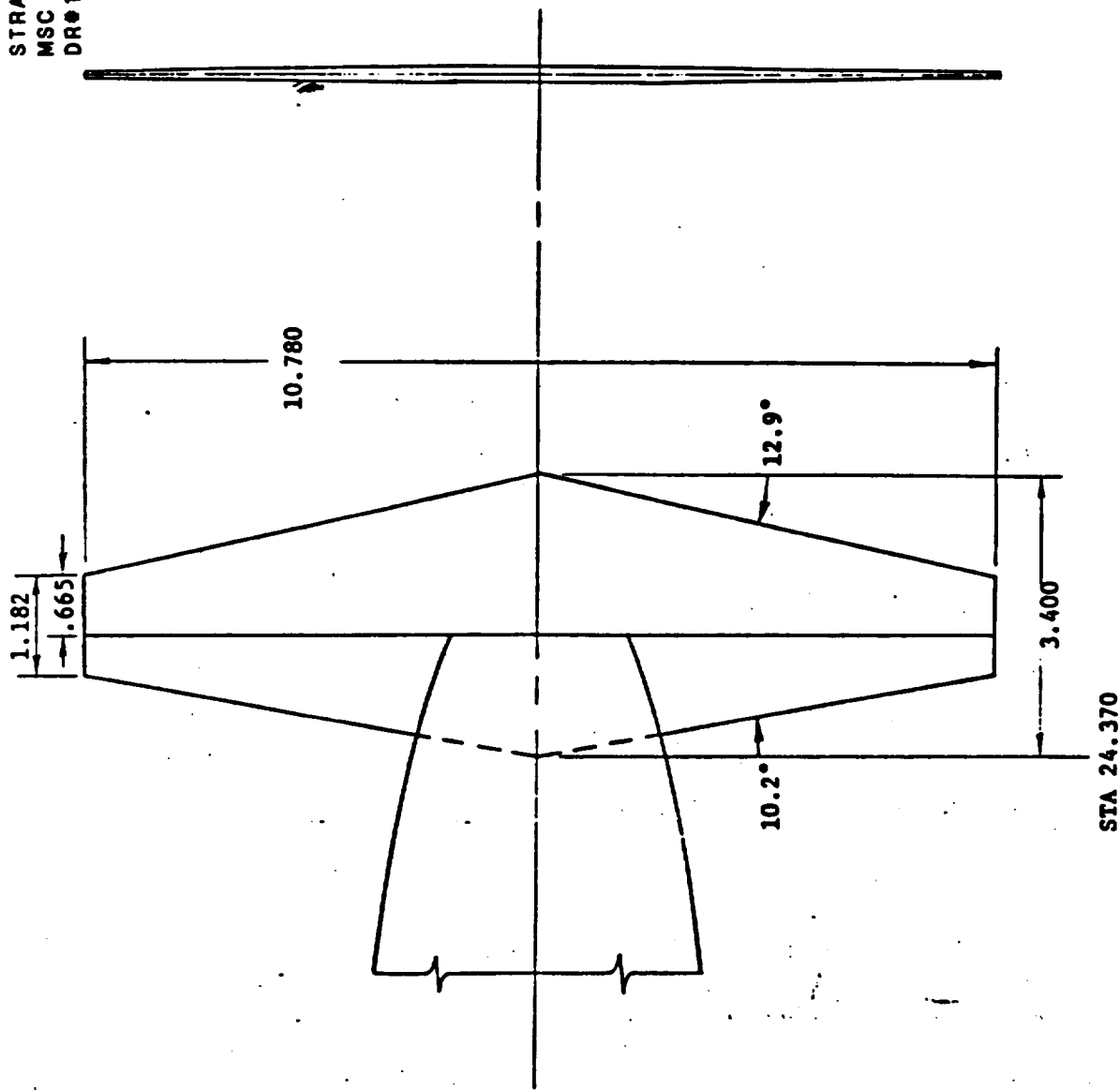
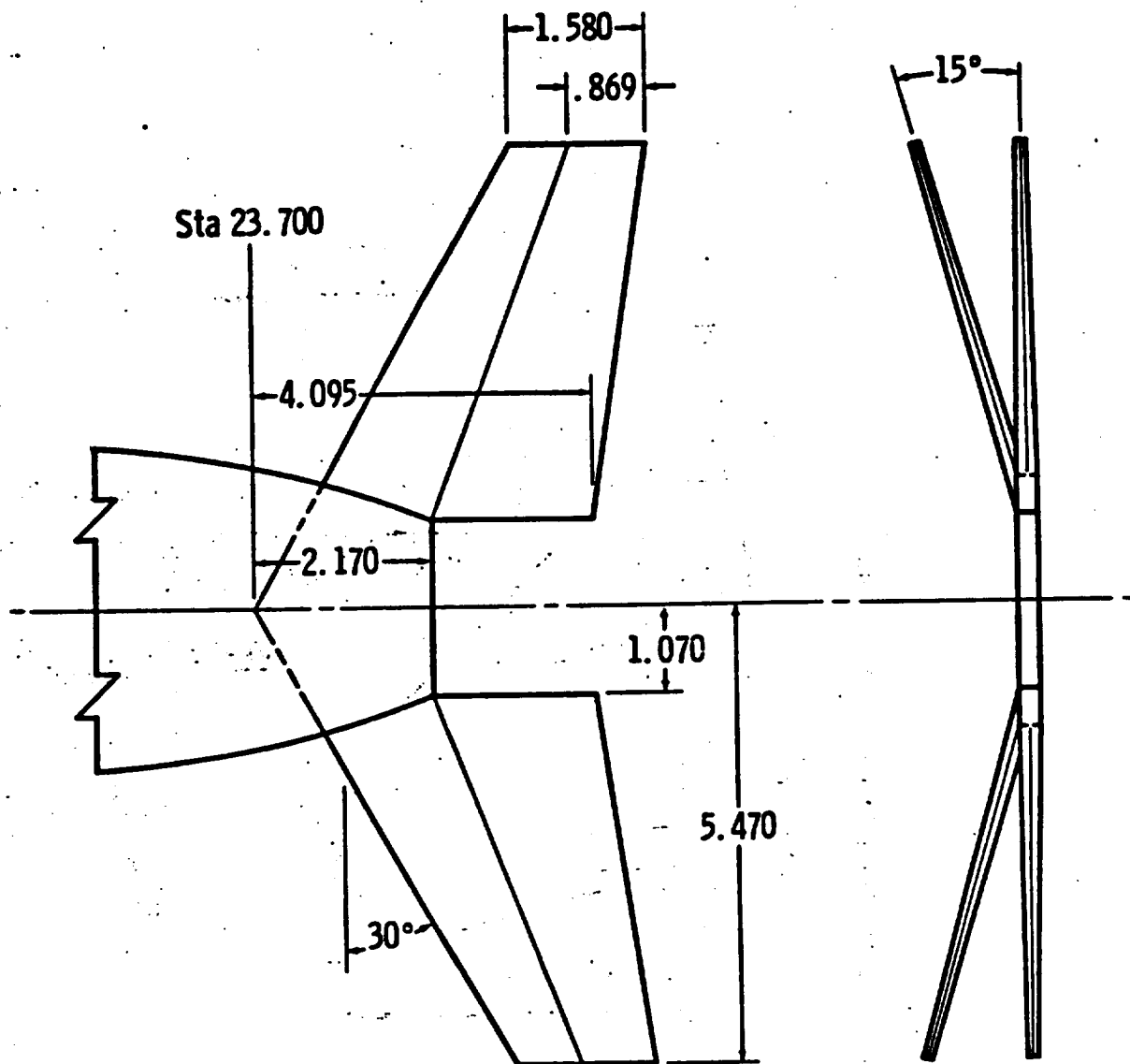


FIGURE 7. HORIZONTAL STABILIZER H12



Note: Rear view shows two possible dihedral positions of H_{13} , $r=0.0^\circ$ and $r=15.0^\circ$.

FIGURE 8. HORIZONTAL STABILIZER H13

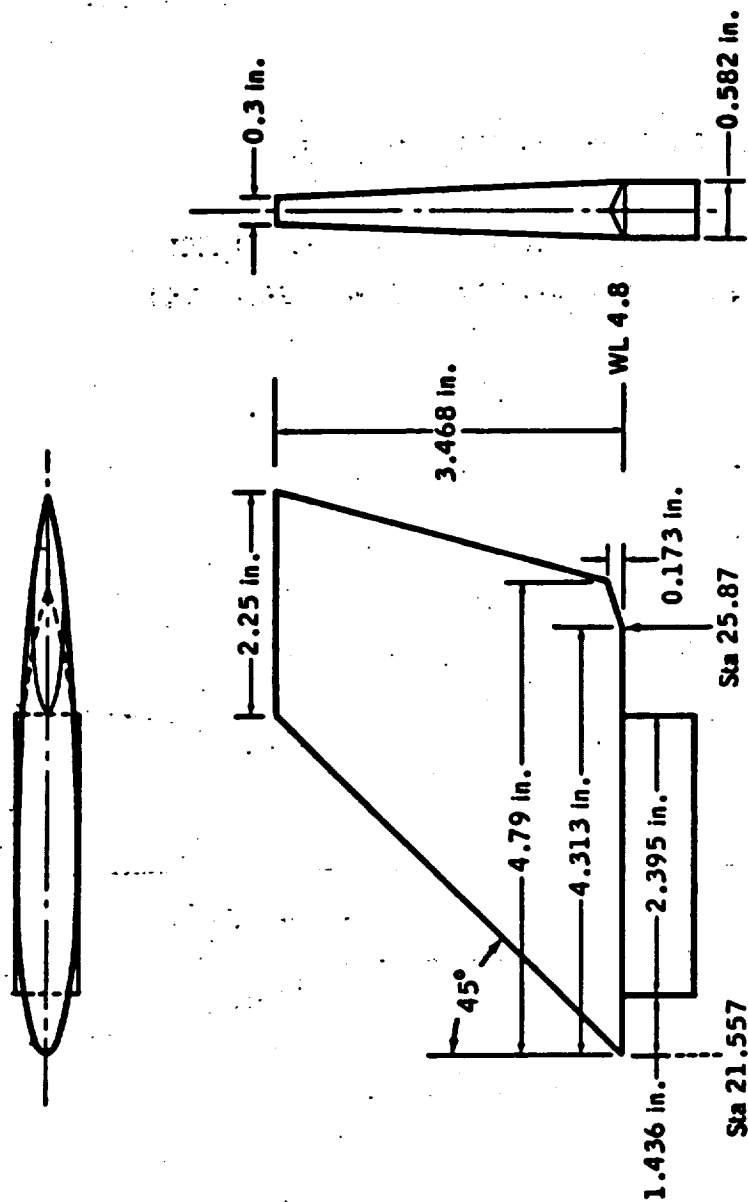


FIGURE 9. VERTICAL STABILIZER V3

DATE _____

REVISED _____

REVISED _____

PAGE _____

REPORT _____

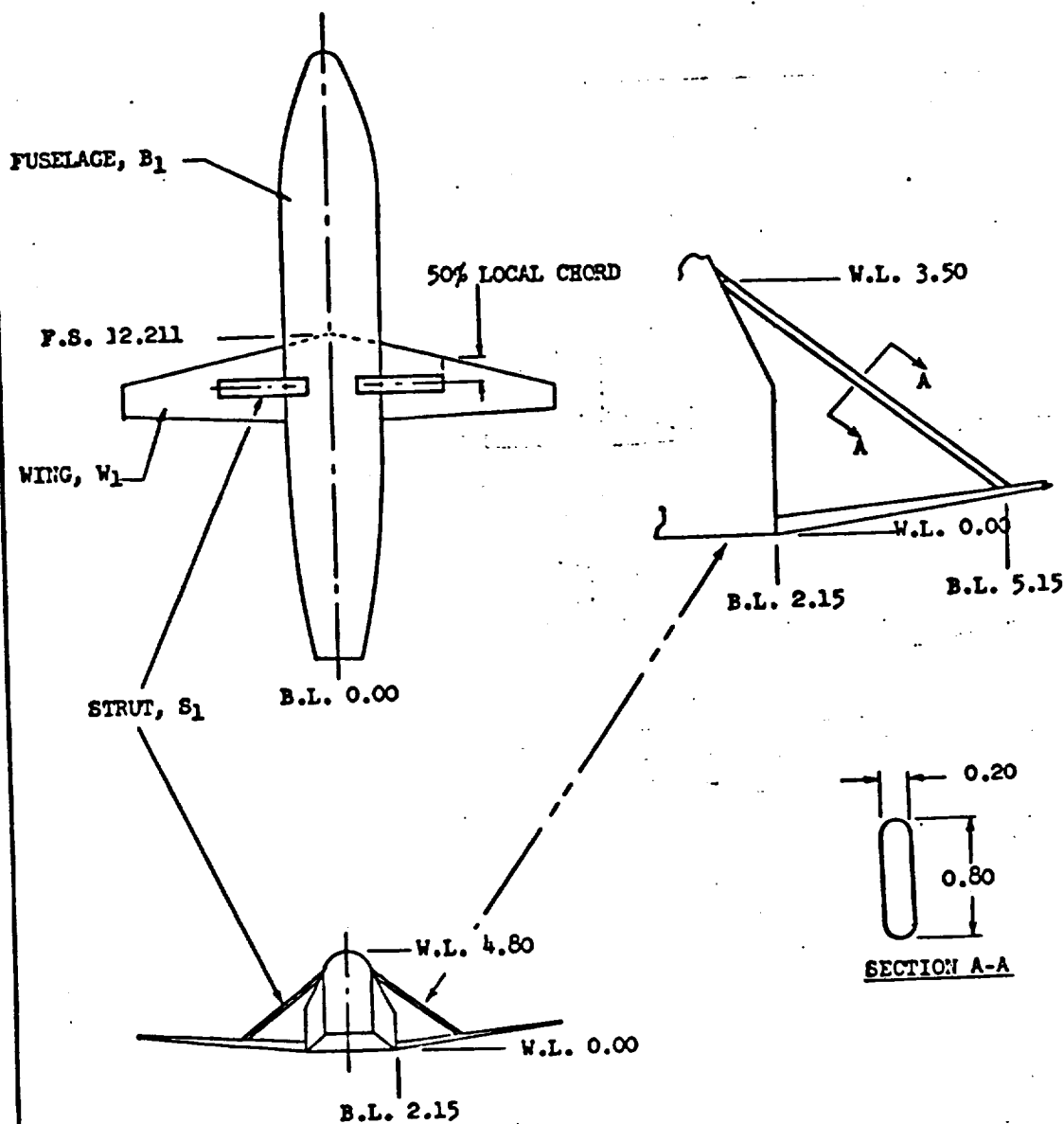
MODEL S-5 Orbiter

STRAIGHT WING ORBITER

MSC

DR#1007 B-1-709

WING STRUT, S₁



Notes:

1. All dimensions are model scale in inches.
2. Strut was fabricated from wood stock.

FIGURE 11. WING STRUT, S₁

MAC 13111 (REV 1 AUG 67)

MCDONNELL

ST. LOUIS, MISSOURI

DATE _____

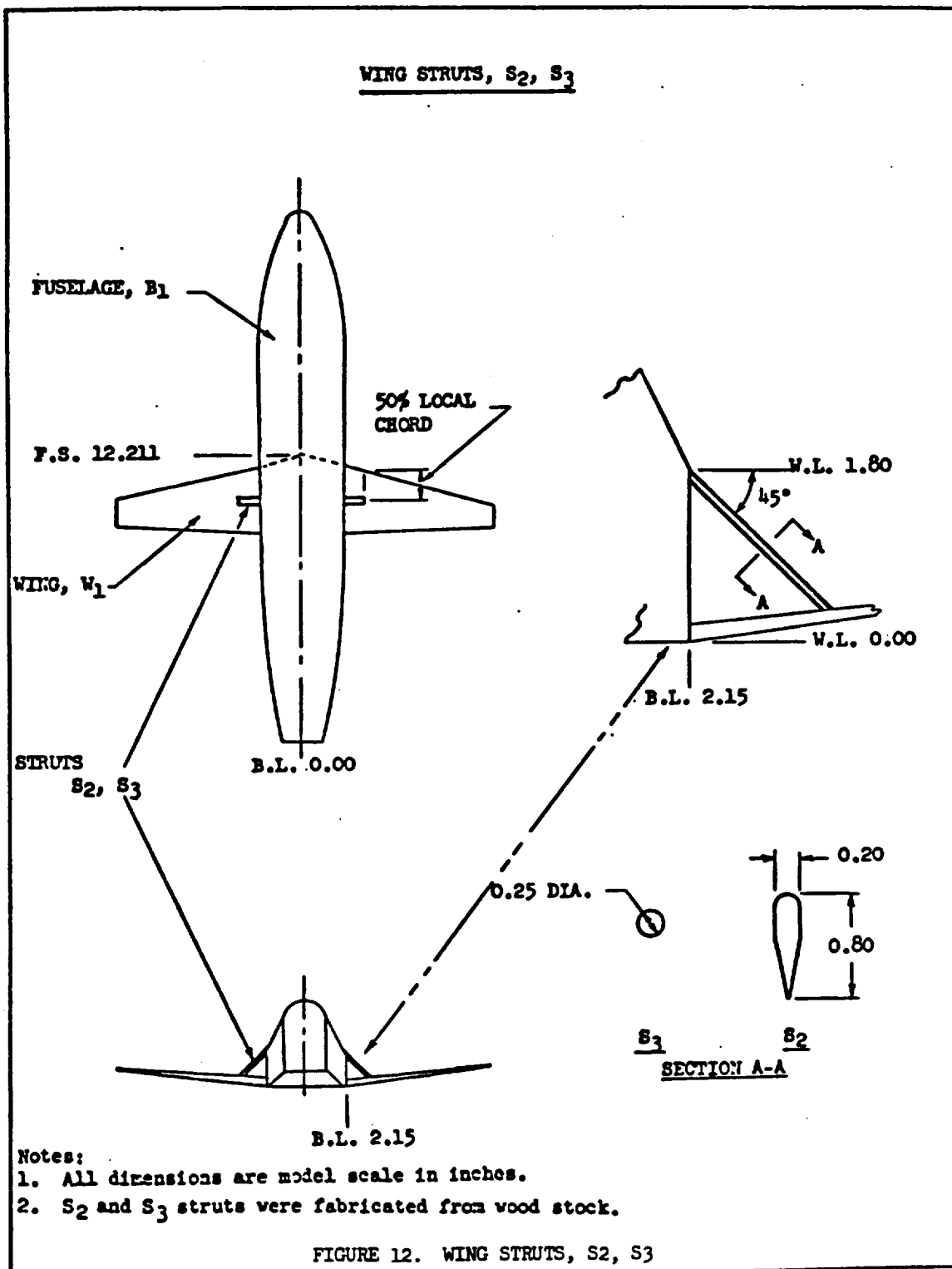
REVISED _____

REVISED _____

PAGE _____

REPORT _____

MODEL S-5 Orbiter



ORIGINAL PAGE IS
OF POOR QUALITY

TEST MSC S-VI DATA SET COLLATION SHEET
Force Model S-5 of the NASA/MSC Orbiter Shuttle (1.875%)

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS																				
		α	β	oe	lt		.25	1	2	25	3	4	29	5	6	7	8	9	10	11	12	13	26	20	19	18	17
RG1001	B1	A	0	-	-																						
RG1002	B1W			-	-																						
RG1003	B1 H6			0	0																						
RG1004	B1 WIV3			-	-																						
RG1005	B1 V3H6			0	0																						
RG1006	B1 W V3H6 Off			Off																							
RG1007	B1 W V3H6			0																							
RG1008				-2																							
RG1009				2																							
RG1010				-4																							
RG1011				4																							
RG1012				-6																							
RG1013				6																							
RG1014				-10																							
RG1015				10																							
RG1016	B1W V3H6			0	20																						
RG1017	B1 H6			-5	0																						
RG1018	B1 WIV6			-5	0																						
RG1019	B1 V3H6			-5	0																						
RG1020	B1 WIV3H6			-5	0																						

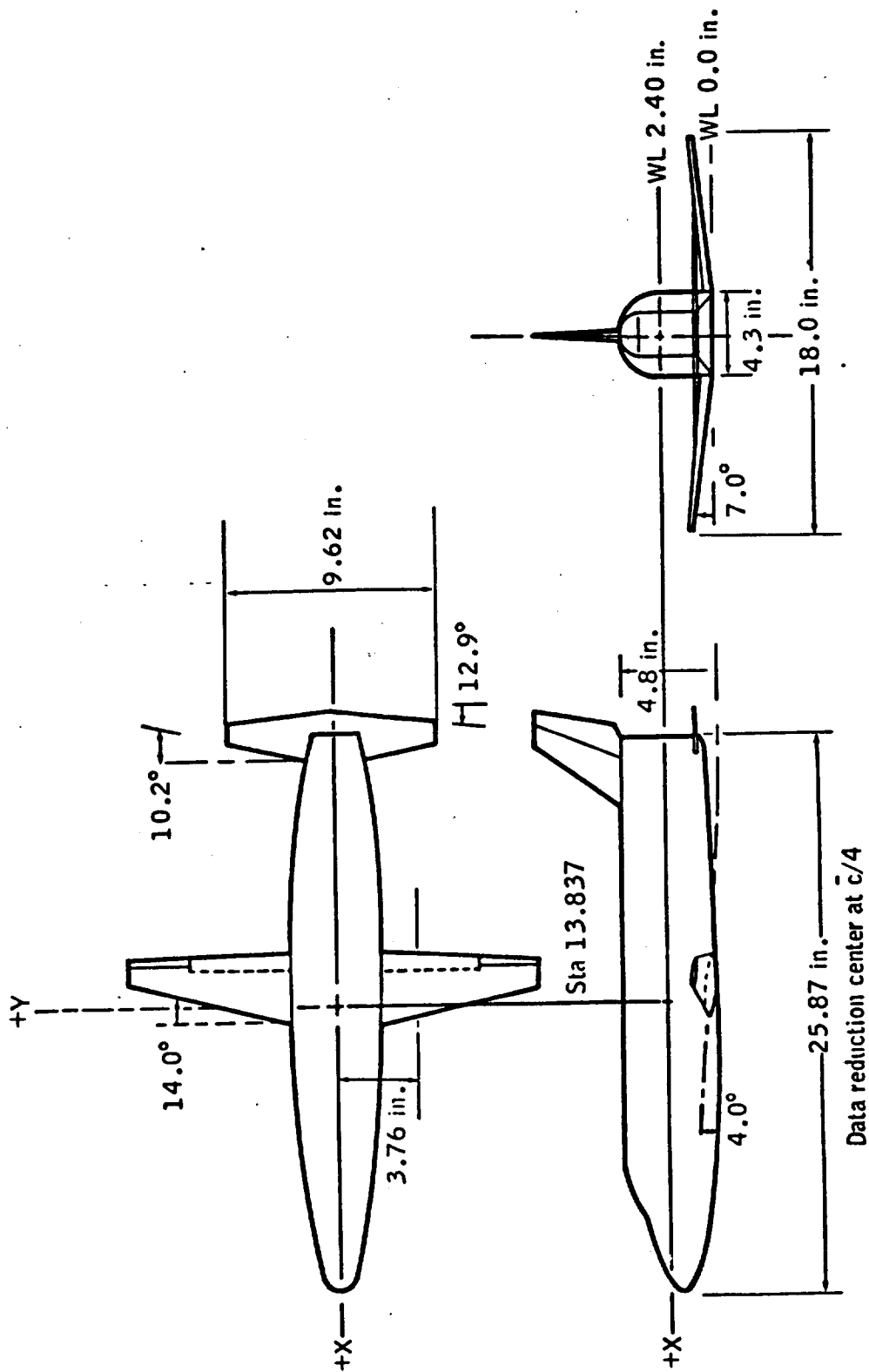
COEFFICIENTS:

CATACLY CN CL CNA CYN CL CD

Q A=6 thru 16

α or β
SCHEDULES

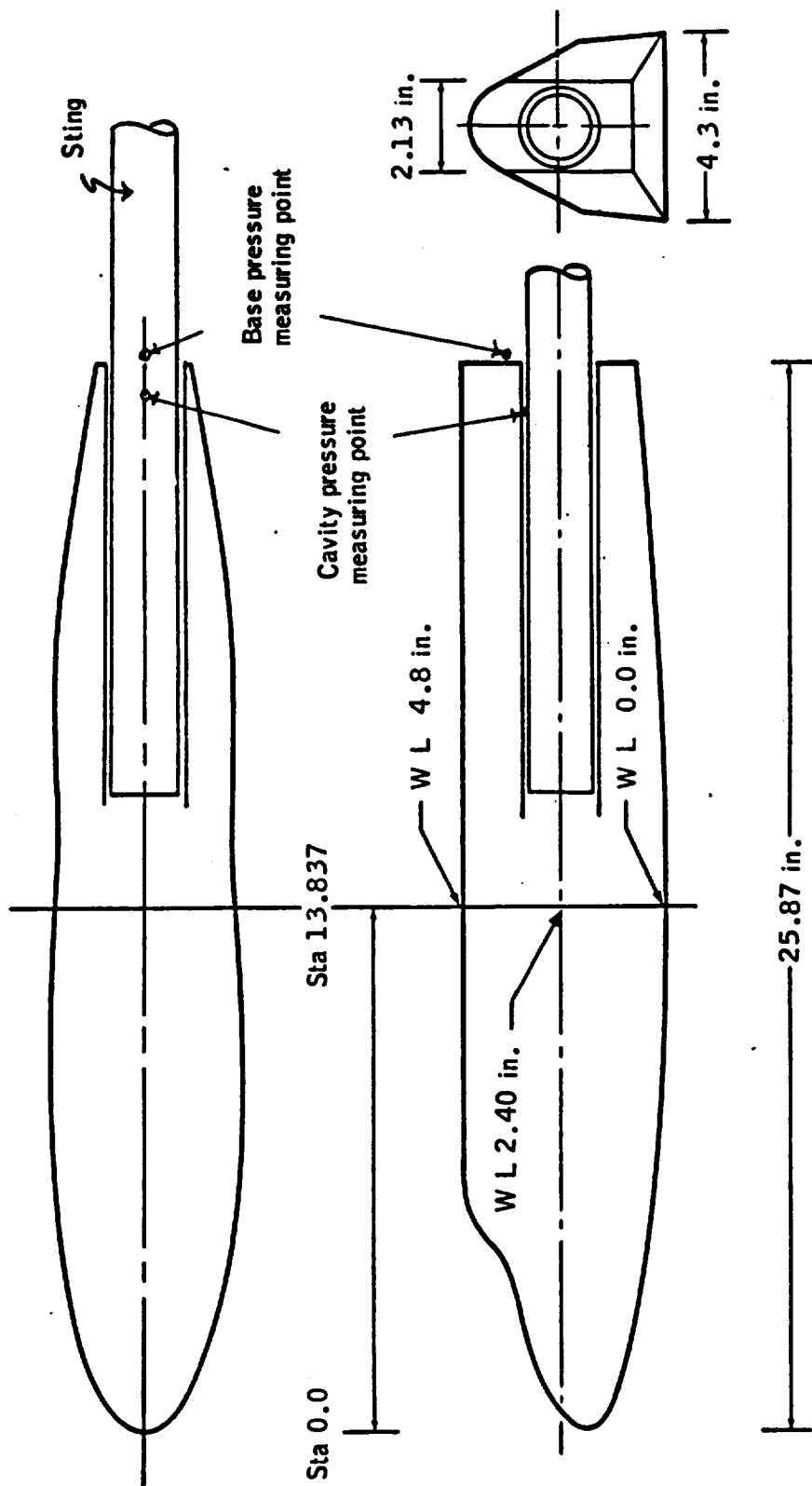
STRAIGHT WING ORBITER
MSC
DR#1008 B-1- 711



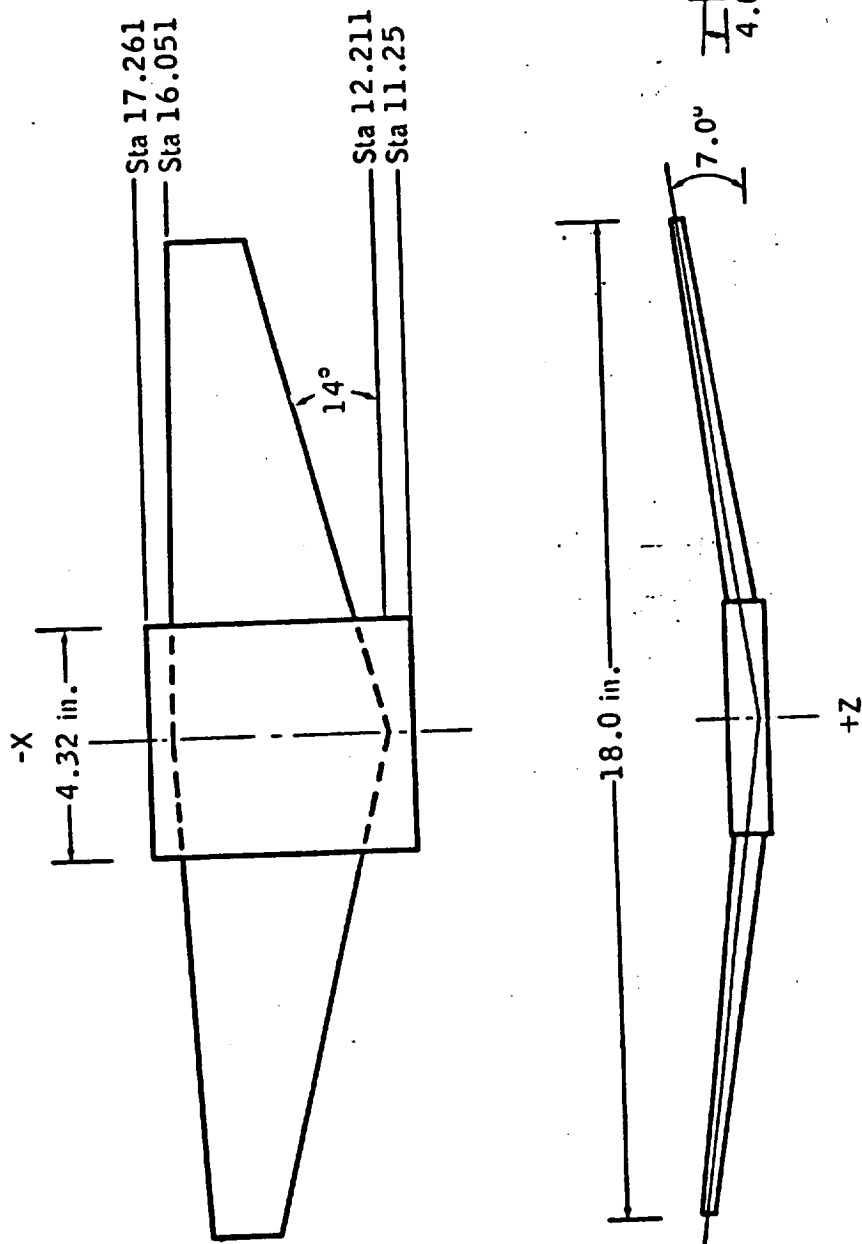
(a) Configuration $B_1 W_1 V_1 H_6$.

Figure 2.- Model S-5, 0.01875 scale model of the MSC orbiter shuttle base-line configuration.

STRAIGHT WING ORBITER
MSC
DR#1008 B-1- 713



(b) Fuselage (B_1).
 Figure 2.- Continued.



(c) Wing (W_1).

Figure 2.- Continued.

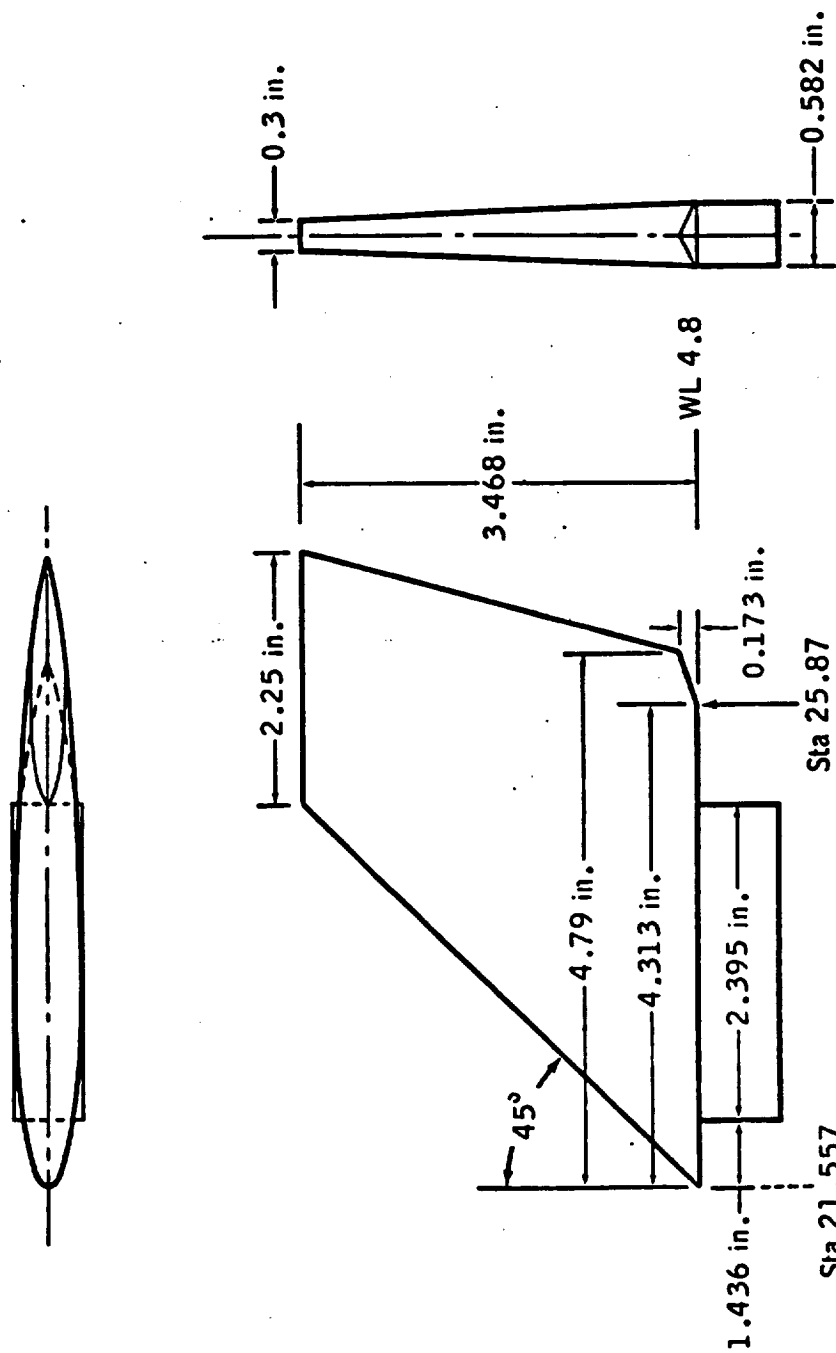
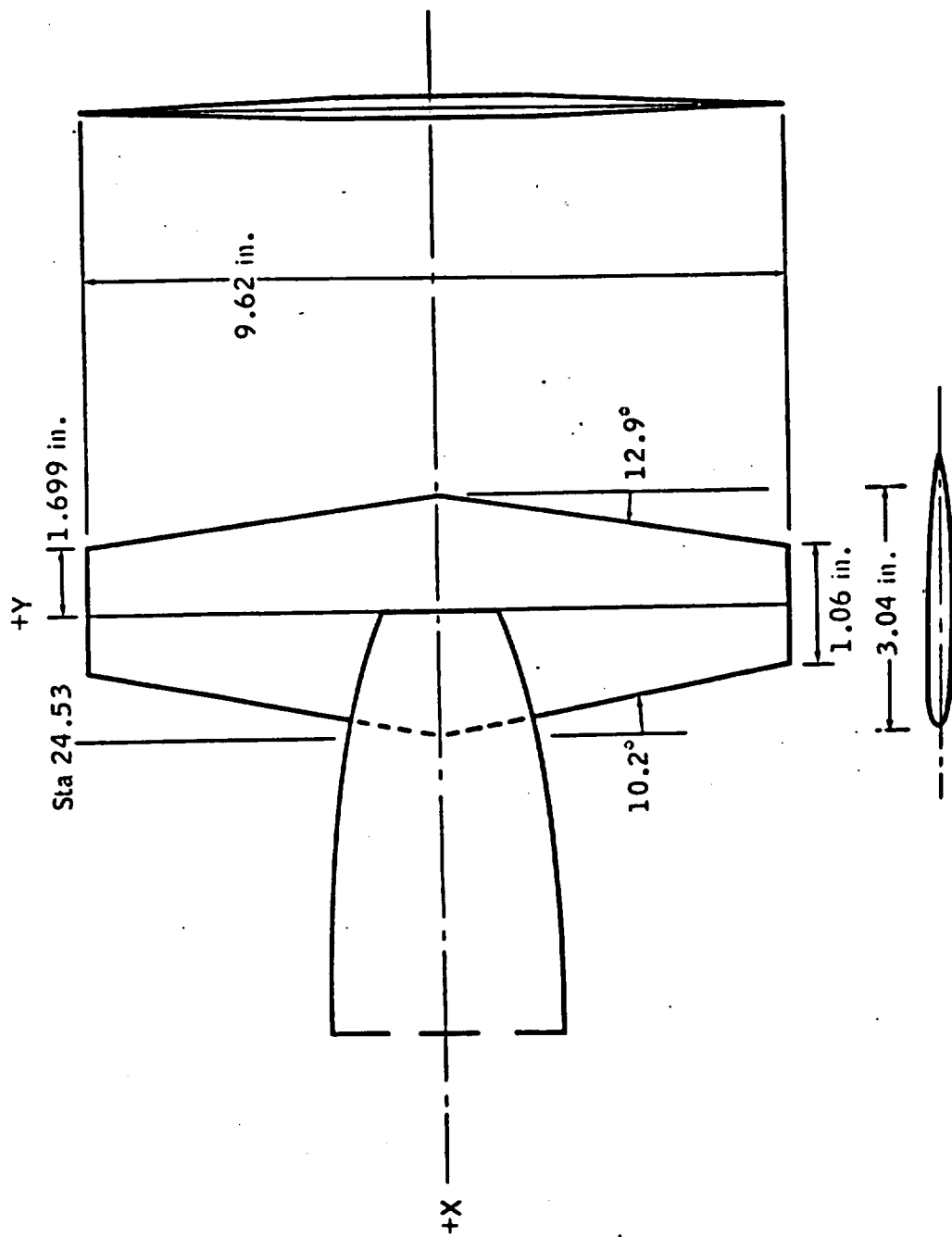
(d) Vertical stabilizer (V₃).

Figure 2.- Continued.



(e) Horizontal stabilizer (H₆).

Figure 2.- Concluded.

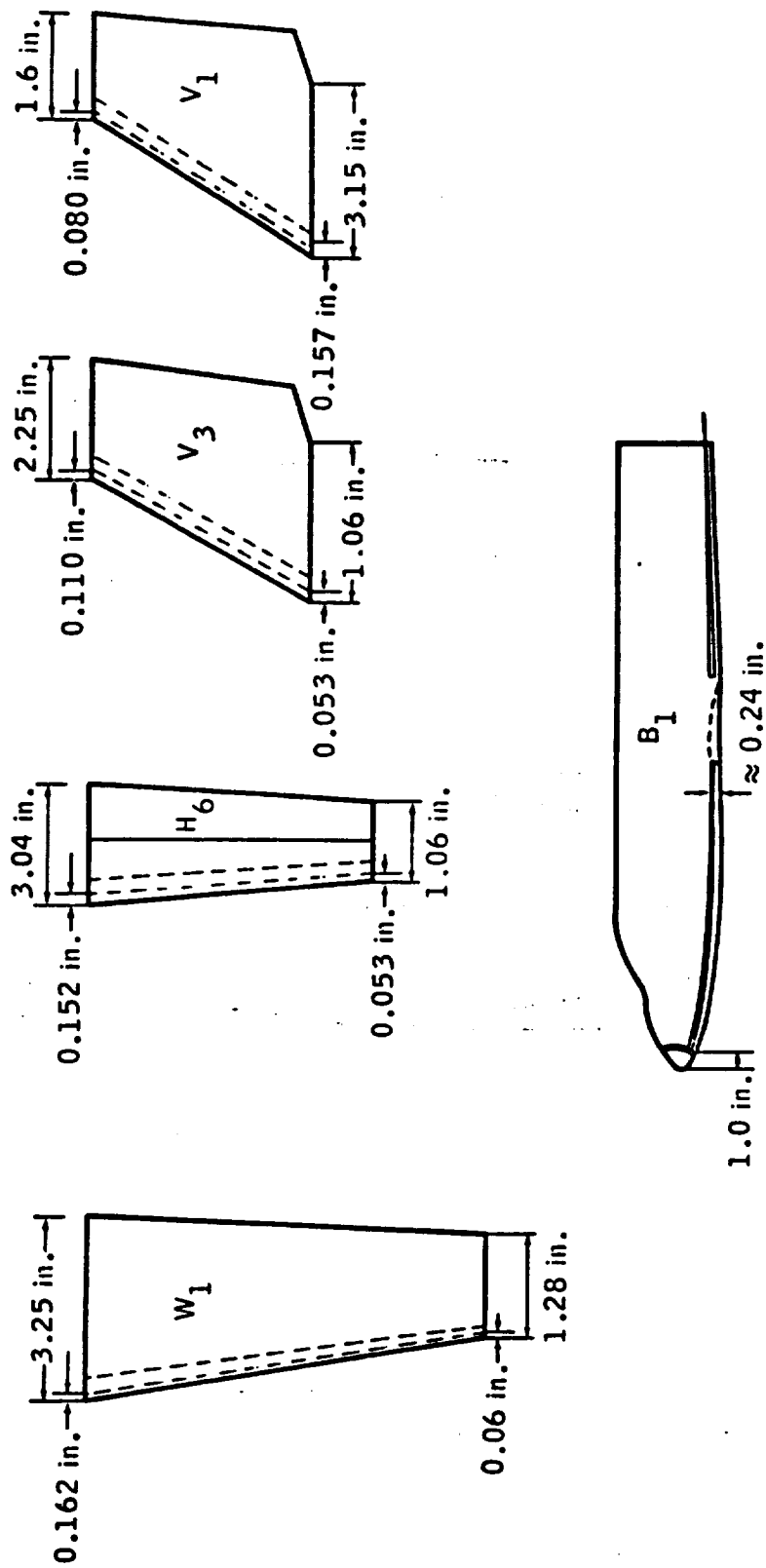


Figure 3.- Grit stripping.

ORIGINAL PAGE IS
OF POOR QUALITY

TEST AMES 646-405 DATA SET COLLATION SHEET

☐ PRETEST

☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		α	β	δ	ϵ		.25	.61	.70	.80	.90	1.10	1.50	2.00		
WA7083	BW2V3H6 E10	0	0	0	0	2		31								
WA7093	E30	0	0	30		2		20								
WA7043	E0	0	0	0	0	2			101	100						
HA7073	E-30	0	0	-30		4					13	12	11	10		
HA7063	E-20	0	0	-20		4					35	34	33	32		
HA7053	E-10	0	0	-10		4					24	23	22	21		
HA7041	E0	0	0	0		4					65	64	63	62		
HA7083	E10	0	0	10		4					30	29	28	27		
HA7093	E30	0	0	30		4					19	18	17	16		
RA7046	E0	0	0	0		4	61	60	59	58						
PA7046	E0	0	0	0		1		60								
PA7047	E0	31	0	0		1		57								
PA7048	E0	62	0	0		1		52								
SA7047	E0	31	0	0		4					56	55	54	53		
SA7048	E0	62	0	0		4					51	50	49	48		
KA7073	E-30	0	0	-30		2	15	14								
KA7063	E-20	0	0	-20		2	37	36								
KA7051	E-10	0	0	-10		2	69	68								
KA7041	E0	0	0	0		2	67	66								
KA7081	BW2V3H6 E10	0	0	0	10	2	71	70								

1 7 13 19 25 31 37 43 49 55 61 67 7576

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

α or β

SCHEDULES

STRAIGHT WING ORBITER
MSC
DR#1011 B-1-721

TEST AMES 645-165 DATA SET COLLATION SHEET

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		A	B	α	β		25	31	37	43	49	55	61	67	73	76
YA7083	BW2V3H6 E10	1	0	0	0	1	25	31								
YA7093	E30	1	0	0	0	1	20									
IA7042	E0	2	0	0	0	2		101	100							
IA7073	E-30	4	0	0	-30	4				13	12	11	10			
IA7063	E-20	4	0	0	-20	4				35	34	33	32			
IA7053	E-10	4	0	0	-10	4				24	23	22	21			
IA7041	E0	4	0	0	0	4				65	64	63	62			
IA7083	E10	4	0	0	10	4				30	29	28	27			
IA7093	E30	4	0	0	30	4				19	18	17	16			
VA7046	E0	1	0	0	0	1	61	60	59	58						
QA7046	E0	1	0	0	0	1	60									
QA7047	E0	1	0	0	0	1	57									
QA7048	E0	1	0	0	0	1	52									
QA7047	E0	1	0	0	0	1										
QA7048	E0	1	0	0	0	1										
QA7073	E30	2	0	0	-30	2	15	14								
GA7063	E20	2	0	0	-20	2	37	36								
GA7051	E-10	2	0	0	-10	2	26	25								
GA7041	E0	2	0	0	0	2	67	66								
GA7081	BW2V3H6 E10	2	0	0	0	2	71	70								

COEFFICIENTS: _____
 α or β _____
 SCHEDULES _____

ORIGINAL PAGE IS
OF POOR QUALITY

TEST AMES 646-465 DATA SET COLLATION SHEET

☐ PRETEST
☐ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHID.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS						
		α	β	δ	ϵ		.61	.70	.80	.90	1.10	1.20	1.30
WA7083	BW2V3H6 E-10	C	O	O	10	1	31						
WA7093	E-30	C	O	O	30	1	20						
WA7062	E-10	C	O	O	0	2	103/102						
HA7073	E-30	C	O	O	-20	4				13	42	11	10
HA7063	E-20	C	O	O	-20	4				35	34	33	32
HA7053	E-10	C	O	O	-10	4				24	23	22	21
HA7041	E-10	C	O	O	0	4				65	64	63	62
HA7083	E-10	C	O	O	10	4				30	29	28	27
HA7093	BW2V3H6 E-30	C	O	O	30	4				19	18	17	16
NA7013	B1	60	O	OFF	OFF	1	47			46	45	44	43
NA7023	BW2	60	O	OFF	OFF	1	42			41	40	39	38
NA7043	BW2V3H6 E-10	60	O	O	0	1	8			5	4	3	2
NA7063	E-20	60	O	O	-20	6	37	36		35	34	33	32
ZA7013	B1	60	O	OFF	OFF	5	47			46	45	44	43
ZA7023	BW2	60	O	OFF	OFF	5	42			41	40	39	38
ZA7043	BW2V3H6 E-10	60	O	O	0	5	8			5	4	3	2
ZA7063	BW2V3H6 E-20	60	O	O	-20	6	37	36		35	34	33	32

1	7	13	19	25	31	37	43	49	55	61	67	
IDFVAR(1) IDFVAR(2) NDV												

COEFFICIENTS:
 α or β
SCHEDULES

STRAIGHT WING ORBITER
MSC
DR#1011 B-1-723

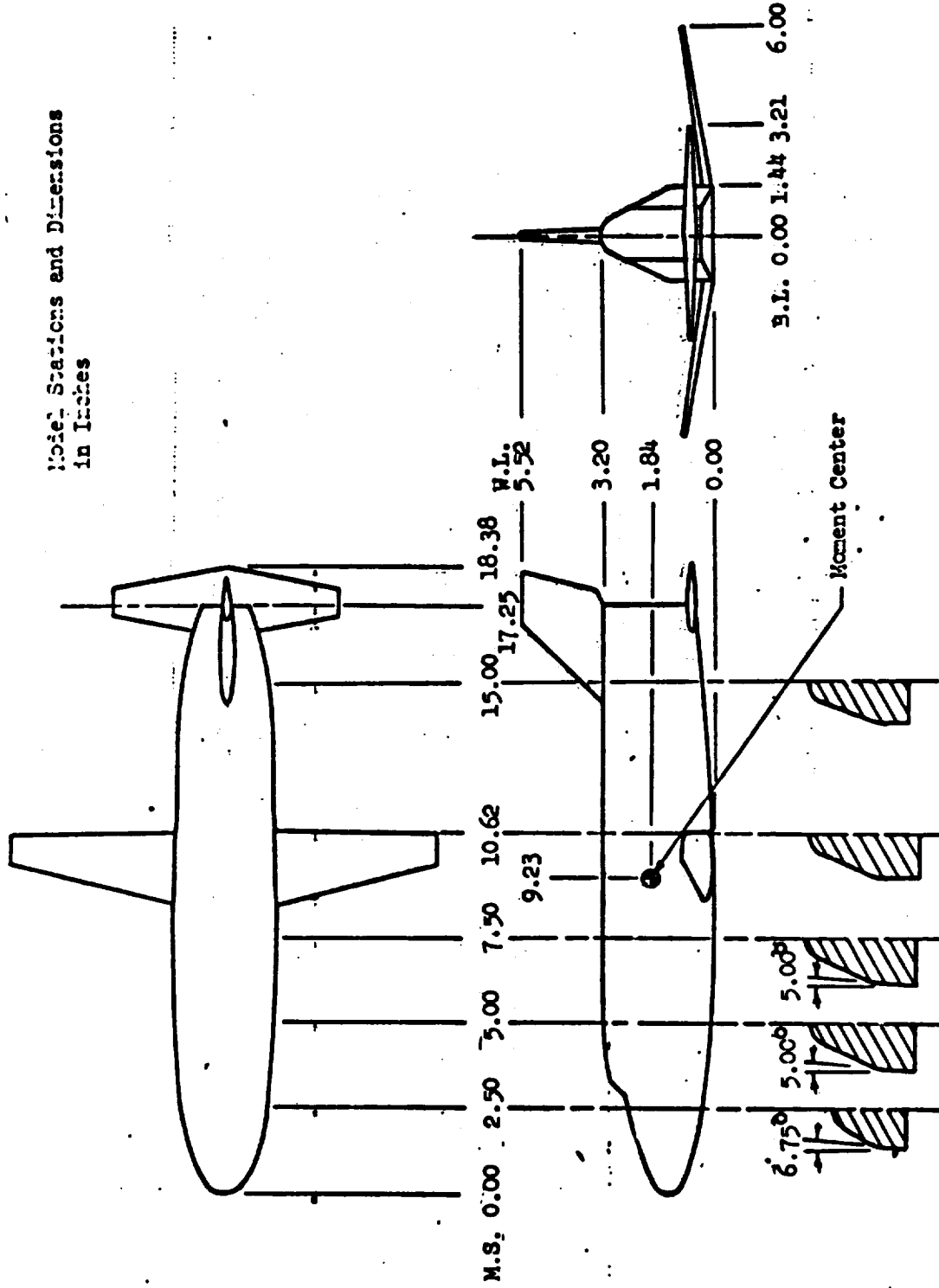
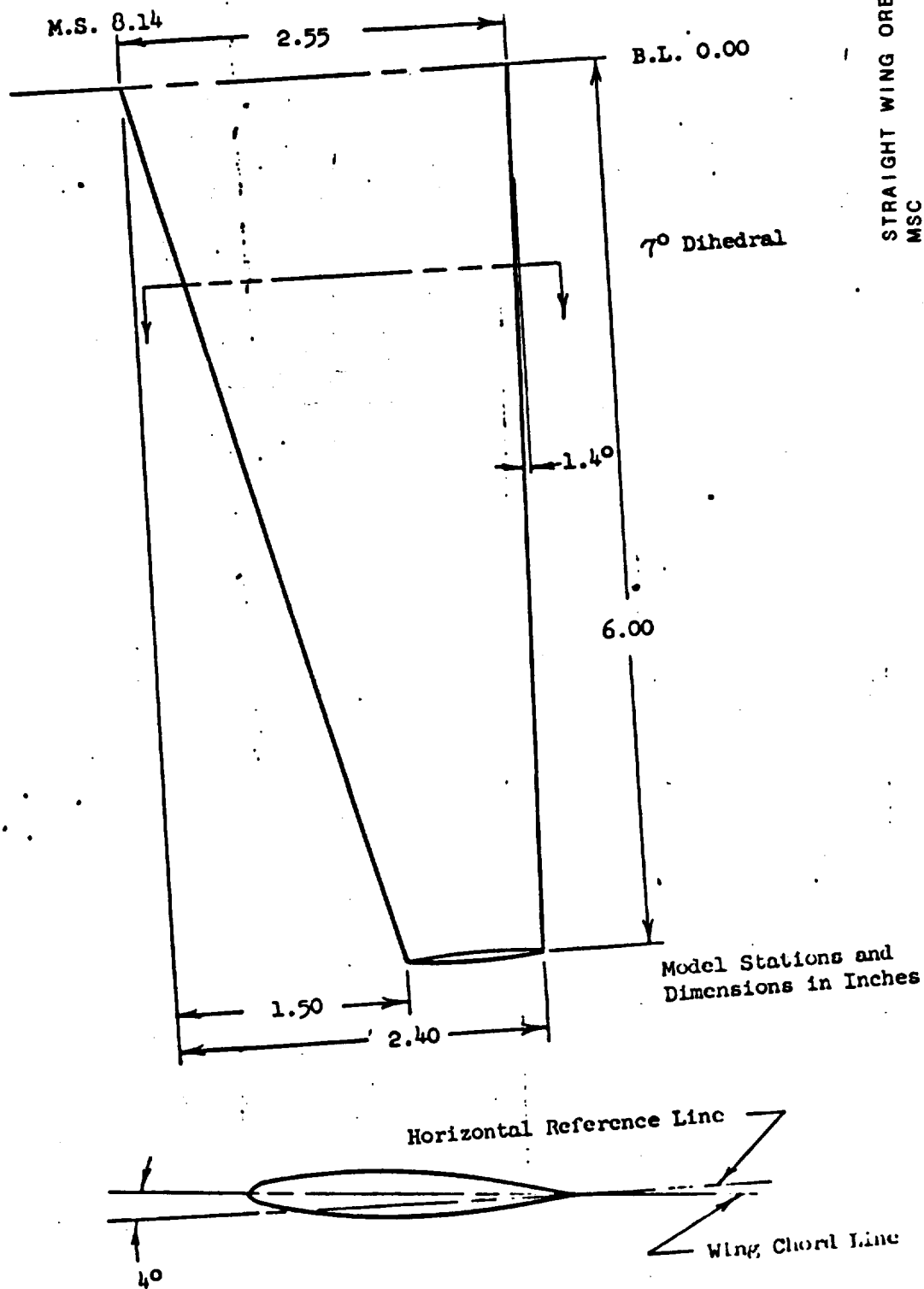


Figure 2. Plan, Elevation and End View of MSC Shuttle Orbiter Model



(a) Wing, W_2

Figure 3. Sketches of wing

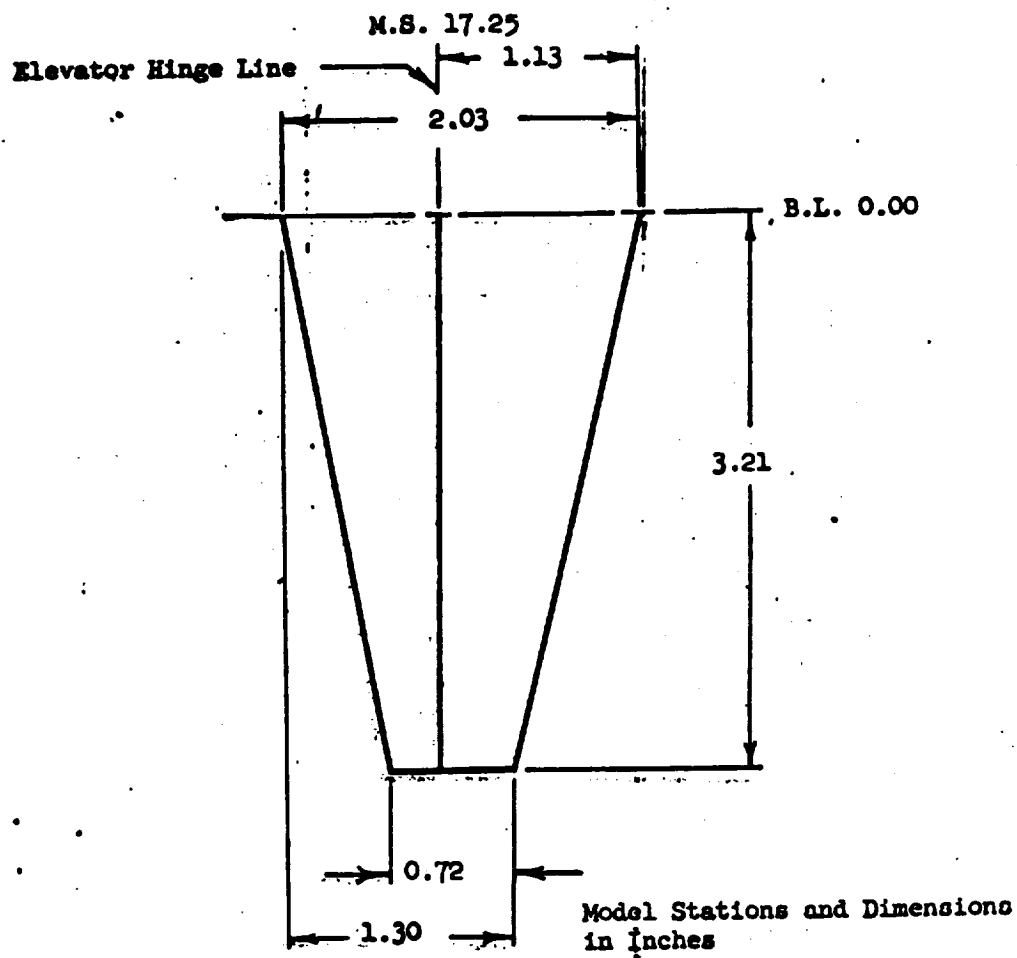
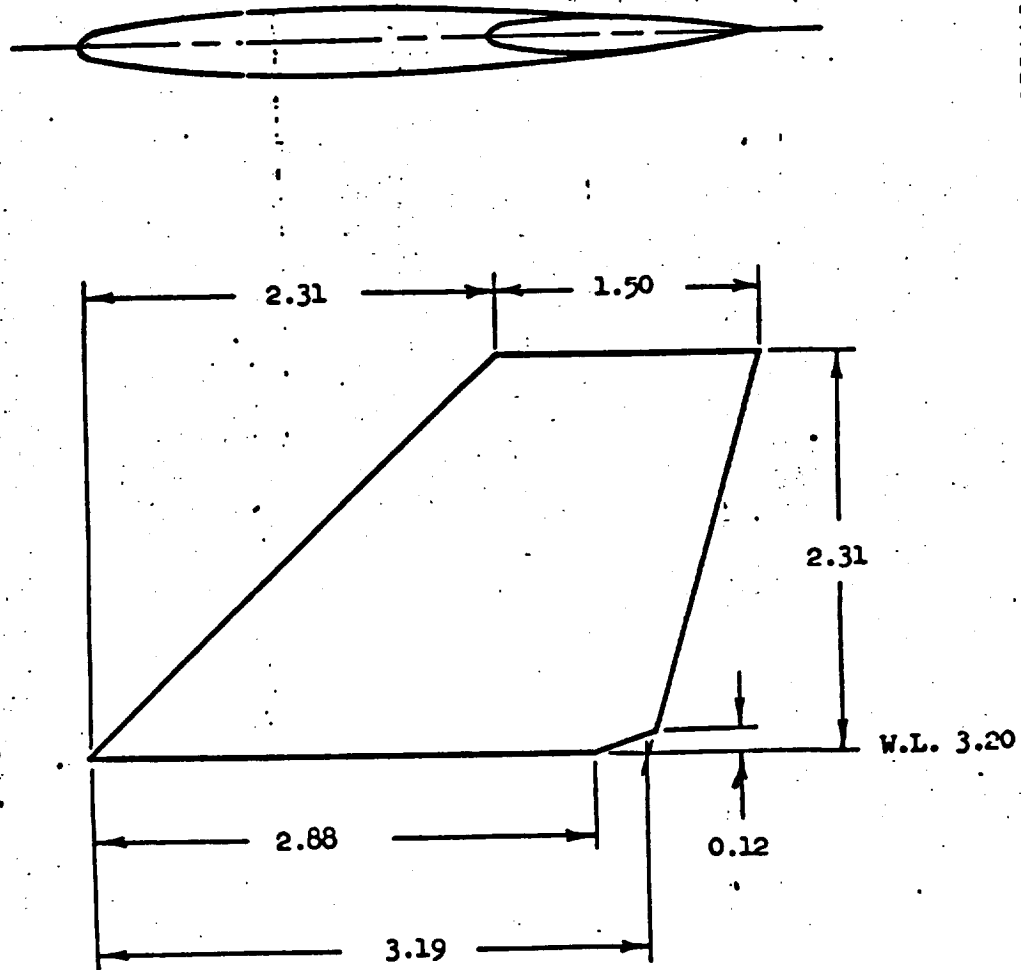


Figure 4. Horizontal stabilizer, H₆

ORIGINAL PAGE IS
OF POOR QUALITY

STRAIGHT WING ORBITER
MSC
DR#1011 B-1- 727



M.S. 14.38

Model Stations and Dimensions
in Inches

Figure 5. Vertical stabilizer, V_3

AMESTEST 11-481 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. OF RUNS	MACH NUMBERS						REYNOLDS NO. PER FT	
		A	B	δ ₀	δ ₁		.6	.7	.8	.9	1.1	1.35	1.4	PM/L
RA5 011	B3	A	0	OFF		4	1		2	3			4	2.5 x 10 ⁶
611						1	5							7.0
711						3			7	8	9			7.5
041	B8					4	13		12	11	10			2.5
241						4	18		17	16	15			4.0
441						4	23		22	21	20			5.75
741						3			27	26	25			7.5
641						1	28							7.0
021	B6					1	29							2.5
221						1	30							4.0
421						1	31							5.75
621						1	32							7.0
731	B7					3			42	41	38			7.5
733						3			43	40	39			7.5
631						1	45							7.0
633						1	44							7.0
031						4	49		48	47	46			2.5
231						1	51							4.0
431						1	53							5.75
451	B8W1					4	58		57	56	55			5.75

COEFFICIENTS: CN CA DCN CLM CY CYN CBL

A = 40, 45, 50, 55, 58, 60, 62, 65, 70°
SCHEDULES
NOTE: DCN = ΔCN DUE TO STING. NDV
DCN IS NOT STANDARD
SADJAC NOTATION.

ORIGINAL PAGE IS
OF POOR QUALITY

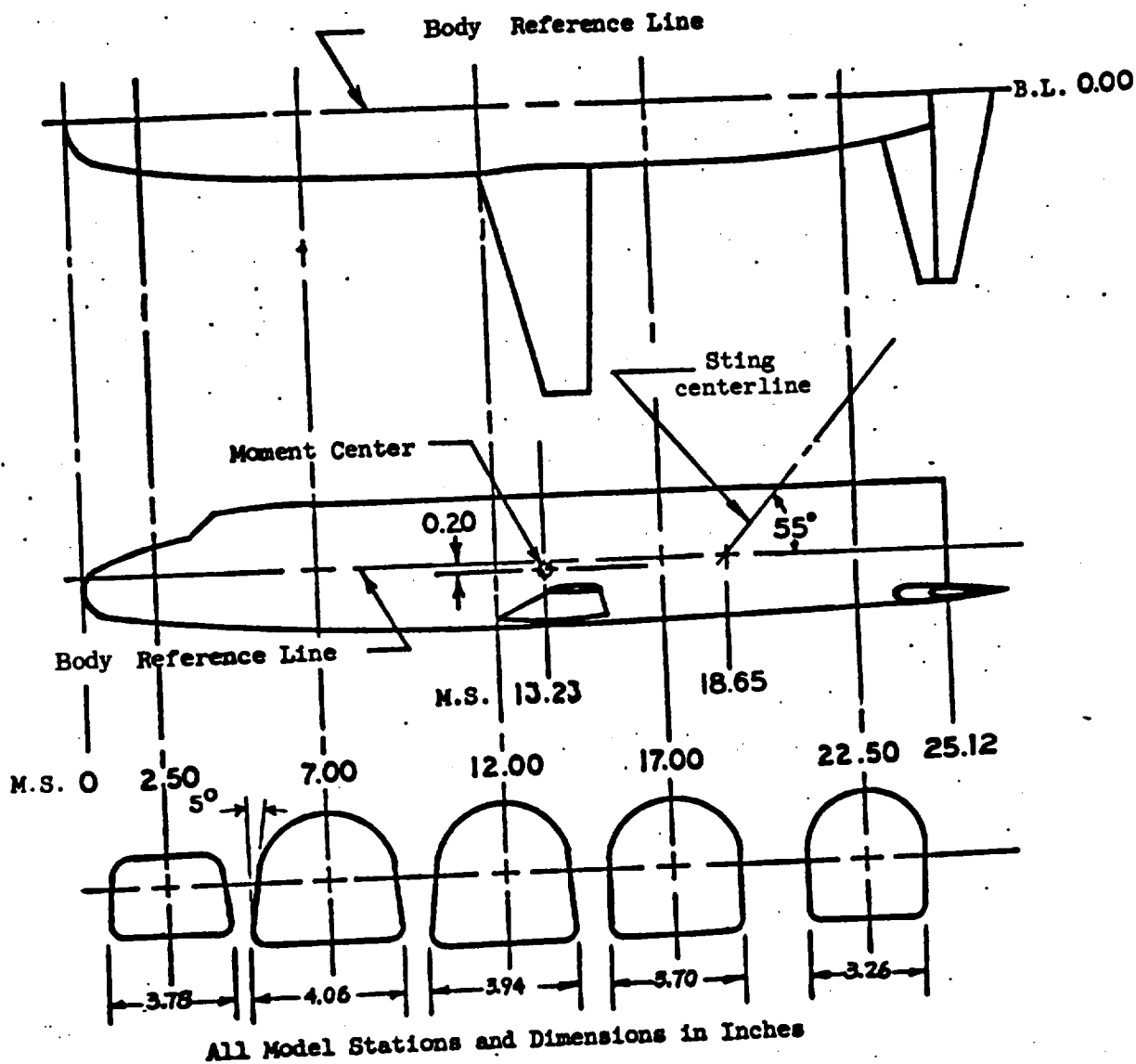
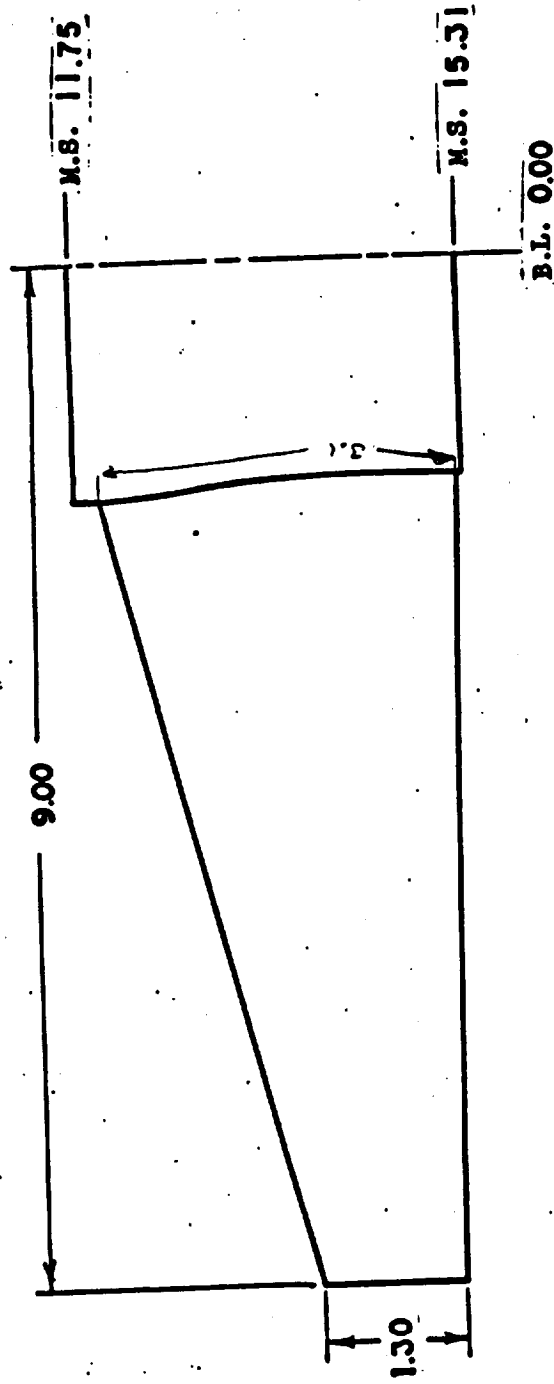


FIGURE 2. Plan and Elevation View of Model.



All Dimensions in Inches

FIGURE 3. Planform of Wing, W₁.

STRAIGHT WING ORBITER
MSC
DR#1012 B-1- 731

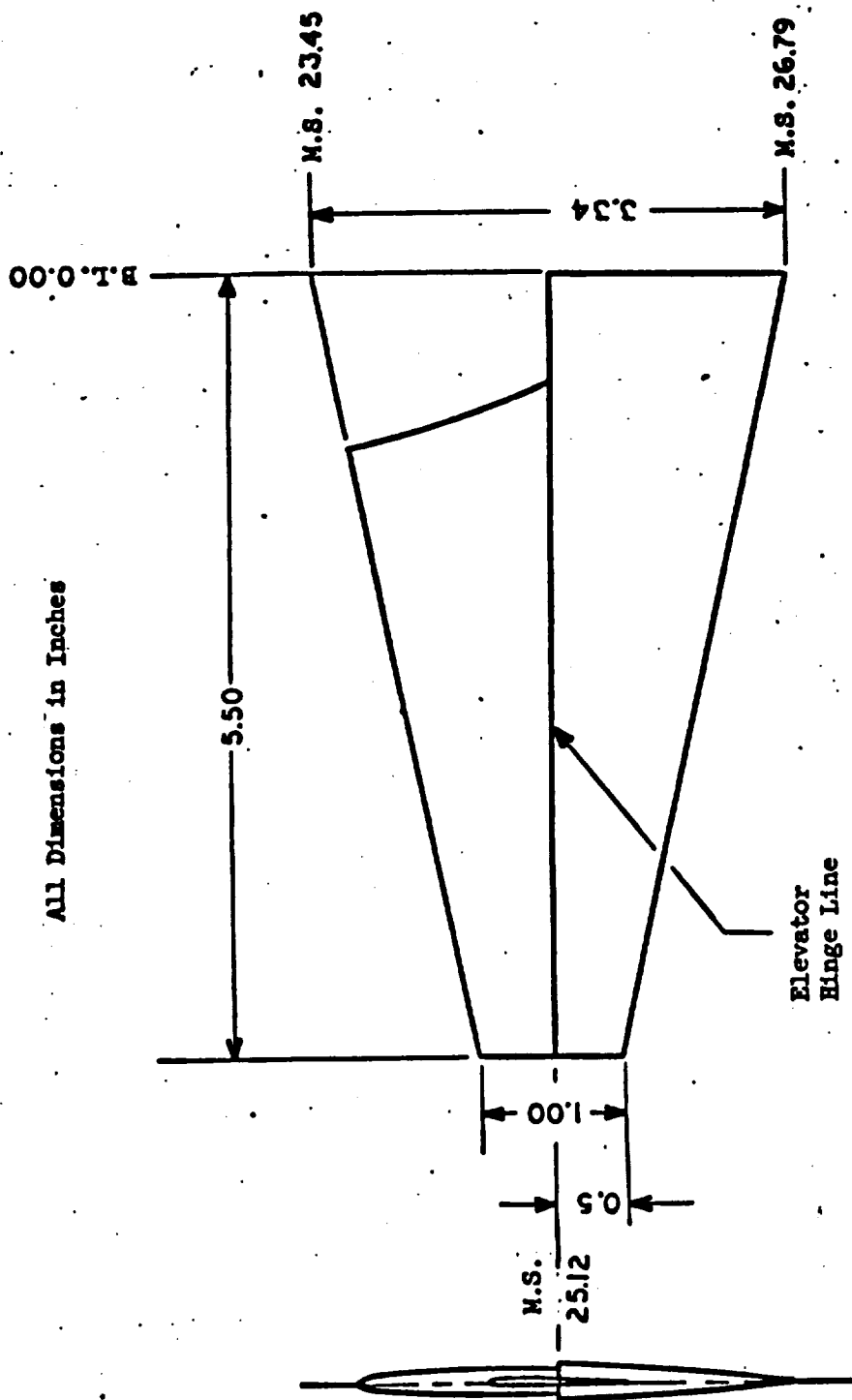


FIGURE 4. Horizontal Stabilizer, H₈.

STRAIGHT WING ORBITER
MSC
DR#1012 B-1- 733

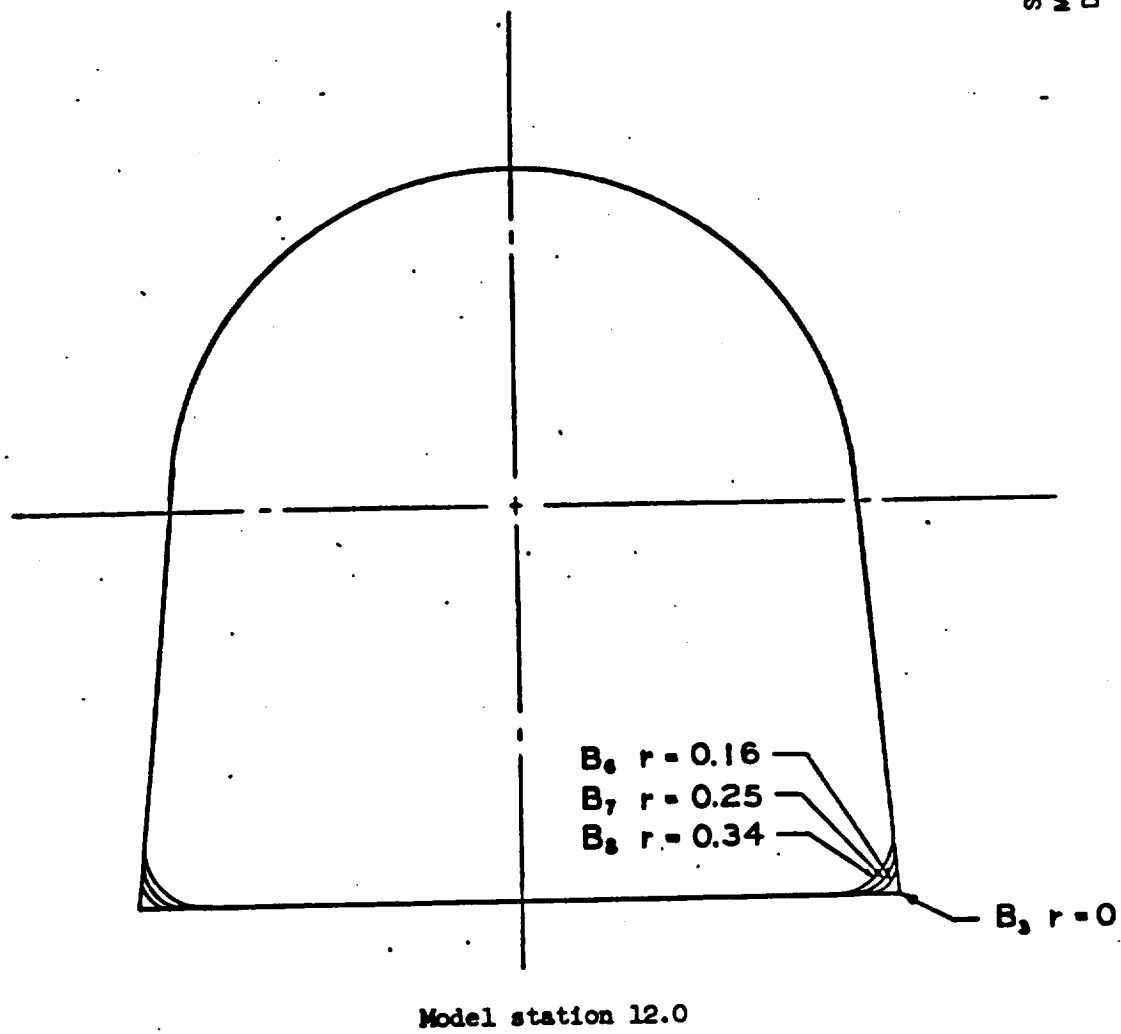


FIGURE 5. Corner Edge Radii

TEST MSC S-XXXXA DATA SET COLLATION SHEET

☒ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. a B	CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
			W44	SP	TT	.25	1	2	3	4	5	7	8	9	10
RG3001	B2	A 0	-	-	-										
2	B2 H7 OFF	1	-	-	-3										
3	B2 H7		-	0	-3										
4	B2 W1 H7		.529	0	-3										
5	B2 W1 H7 OFF		.529	-	-3										
6	B2 V1 H7 OFF		-	-	-3										
7	B2 V1 H7		-	0	-3										
8	B2 W1 V1 H7		.529	0	-3										
9	B2 W1 V1 H7 OFF		.529	-	-3										
10	B2 W1 V1 H7		.691	0	-3										
11	B2 W1 H7		.691	0	-3										
12	B2 W1 H7		.691	0	3										
13	B2 W1 V1 H7		.691	0	3										
14	B2 W1 V1 H7		.529	0	3										
15	B2 W1 V1 H7 OFF		.529	-	3										
16	B2 W1 H7		-	0	3										
17	B2 W1 H7 OFF		.529	-	3										
18	B2 V1 H7		-	0	3										
19	B2 V1 H7 OFF	V	-	-	3										
RG3020	B2 H7 OFF	A 0	-	-	3										

1 7 13 19 25 31 37 43 49 55 61 67 75.76

CA...CY...CN...CBL...VLO...CYN...MACH...ALPHA...1

COEFFICIENTS: A -30, -25, -20, -15, -10, -5, -2, 0, 2, 4, 6, 8, 10, 15, 20, 25, 30, 35

a of B B -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16

SCHEDULES C -10, -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

TEST MSC S-XXXVA DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS									
		a	B	W	X	Y		25	22	23	24	25	26	27	28	29	30
PG3021	B2 H7	A	O	-	0	3											
22	B2 V1 H7			-	0	2											
23	B2 W1 V1 H7			.529	0	2											
24	B2 W1 V1 H7			.529	0	-2											
25	B2 V1 H7			-	0	-2											
26	B2 V1 H7			-	0	-1											
27	B2 W1 V1 H7			.529	0	-1											
28	B2 W1 V1 H7			.698	0	-1											
29	B2 W1 V1 H7			.698	0	1											
30	B2 W1 V1 H7			.529	0	1											
31	B2 V1 H7			-	0	1											
32	B2 V1 H7			-	0	0											
33	B2 V1 H7 OFF			-	-	0											
34	B2 H7 OFF			-	-	0											
35	B2 H7			-	0	0											
36	B2 W1 H7			.529	0	0											
37	B2 W1 H7 OFF			.529	-	0											
38	B2 W1 V1 H7 OFF			.529	-	0											
39	B2 W1 V1 H7	V	V	.529	0	0											
PG3040	B2 W1 V1 H7	A	O	.698	0	0											

1	7	13	19	25	31	37	43	49	55	61	67	73	79
COEFFICIENTS:													
a or B													
SCHEDULES													
IDPVAR(1) IDPVAR(2) IDV													

STRAIGHT WING ORBITER
 MSC
 DR#1057 B-1- 735

ORIGINAL PAGE IS
 OF POOR QUALITY

TEST MSC S-XXXVA DATA SET COLLATION SHEET
S-XVIII

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	HACH NUMBERS									
		A	B	WCH	Sc	IT		.25									
RG3041	B2 W1 H7	A	O	.698	O	O											
42	B2 W1 H7 OFF	A		.698	-	O		42									
43	B2 W1	B		.698	-	-		43									
44	B2 W1	A		.698	-	-		44									
45	B2 W1 V1 H7			.698	-	-		45									
46						O	O	1									
47						O	-4	4									
48						O	-6	5									
49						O	-2	6									
50						O	+2	7									
51	B2 W1 V1 H7 OFF			.698	-	O		8									
52	B2 W1 V1 H7 OFF			.698	-	O		9									
53	B2 W1 V1 H7					O	O	10									
54							+2	11									
55							-2	12									
56							-4	13									
57		A	O				-6	14									
58		-5C					O	15									
59		55					O	16									
60		30					O	17									
61	B2 W1 V1 H7	110C		.698	O	O		18									

1	7	13	19	25	31	37	43	49	55	61	67	73	79
COEFFICIENTS:													
a or b													
SCHEDULES													
IDPVAR(1) IDPVAR(2) NDV													

TEST S-XXXVB DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		α	β	u	v	IT										
RG3067	B4	B	0	-	-	-										
68	B4W1															
69	B4W1 V3															
70	B4W1 V3 H6															
71	B4W1 V3 H6															
72	B4W1 V3 H6															
73	B4W1 V3 H6															
74	B4W1 V3 H6 OFF															
75	B4W1 V3 H6															
76	B4W1 V3 H6															
77	B4W1 V3 H6															
78	B4W1 H6															
RG3079	B4 V3 H6	B	0	-	-	-										

1	7	13	19	25	31	37	43	49	55	61	67	73	79
COEFFICIENTS:													
α or β													
SCHEDULES													

STRAIGHT WING ORBITER
MSC
DR#1057 B-1- 737

ORIGINAL PAGE IS
OF POOR QUALITY.

STRAIGHT WING ORBITER
MSC
DR#1057 B-1- 738

ORIGINAL PAGE 18
OF FOUR QUALITY

TEST S-XVIII DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

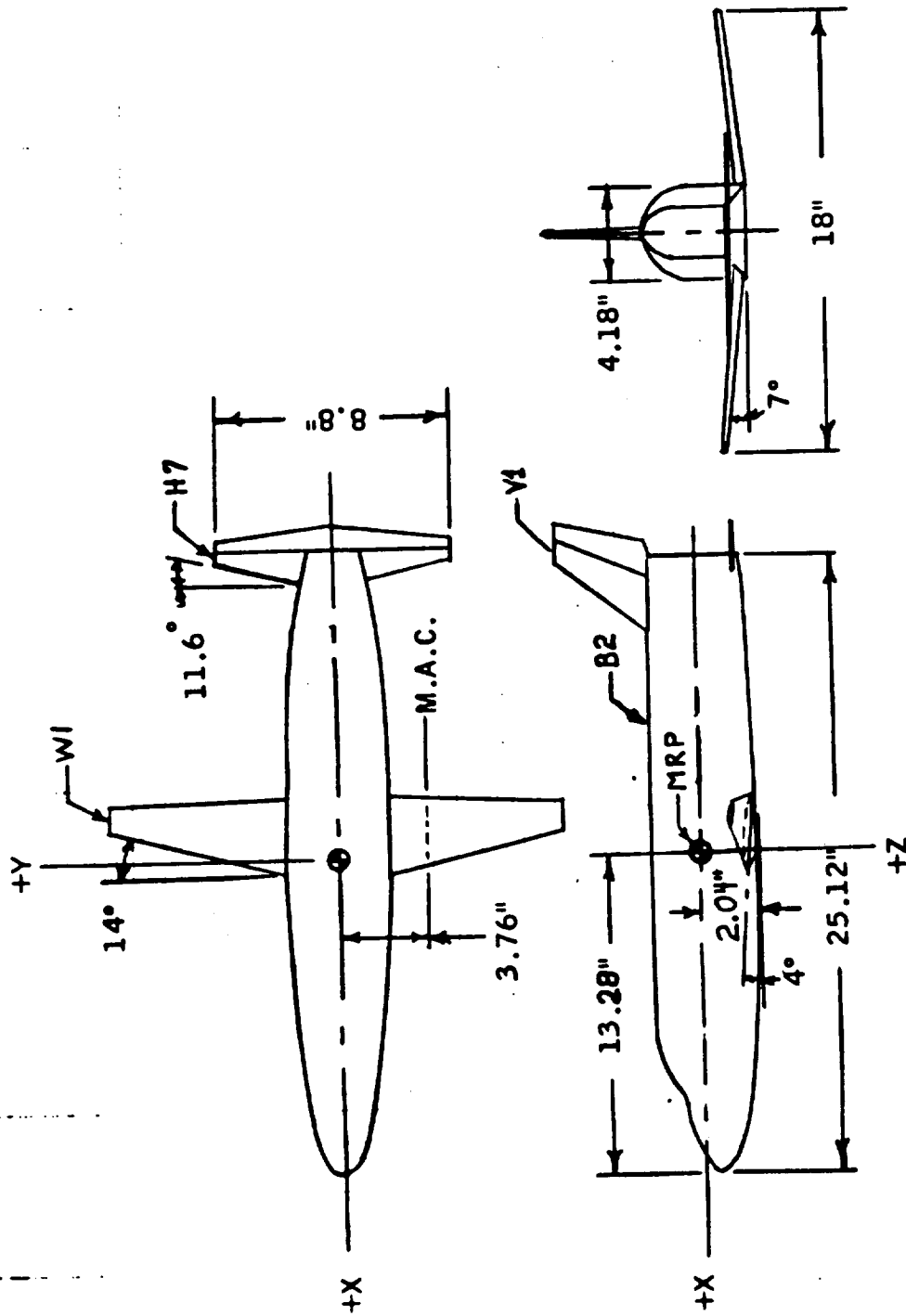
DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS									
		a	B	W	C	I	T	25	19	20	21	22	23	24			
RG3061	B2W1 V1 H7	43	C	191	0	0											
62		43		529													
63		11															
64		9															
65		53															
RG3066	B2W1 V1 H7	0	C	529	0	0											

7 13 19 25 31 37 43 49 55 61 67 75.76

COEFFICIENTS: IDPVAR(1) IDPVAR(2) IDV

a or B
SCHEDULES

ORIGINAL PAGE IS
OF POOR QUALITY



(a) August 15, 1969 baseline representation

Figure 1.- Orbiter model drawings.

STRAIGHT WING ORBITER
MSC
DR#1057 B-1- 739

STRAIGHT WING ORBITER
MSC
DR#1057 B-1- 740

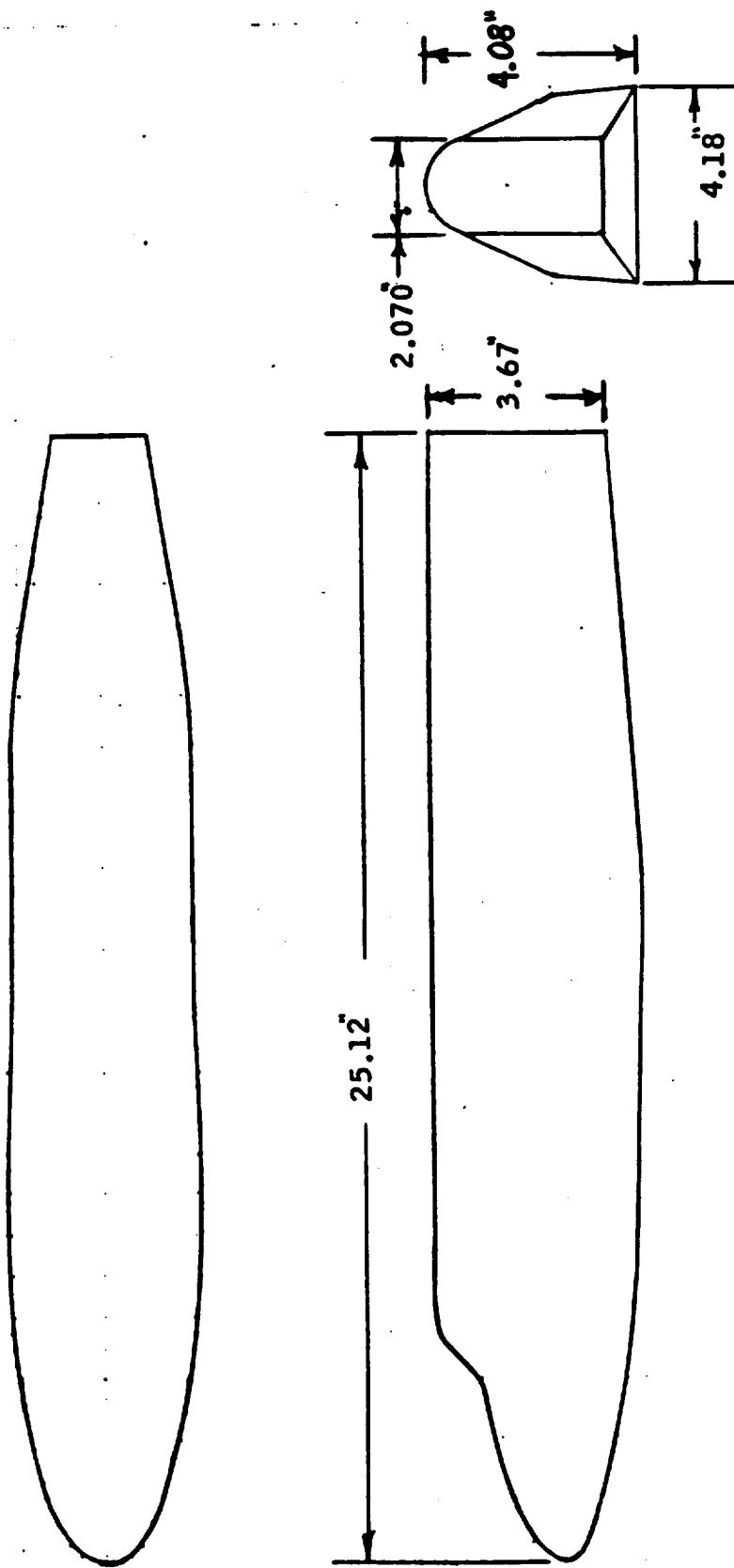


Figure 2. - Fuselage (B₂).

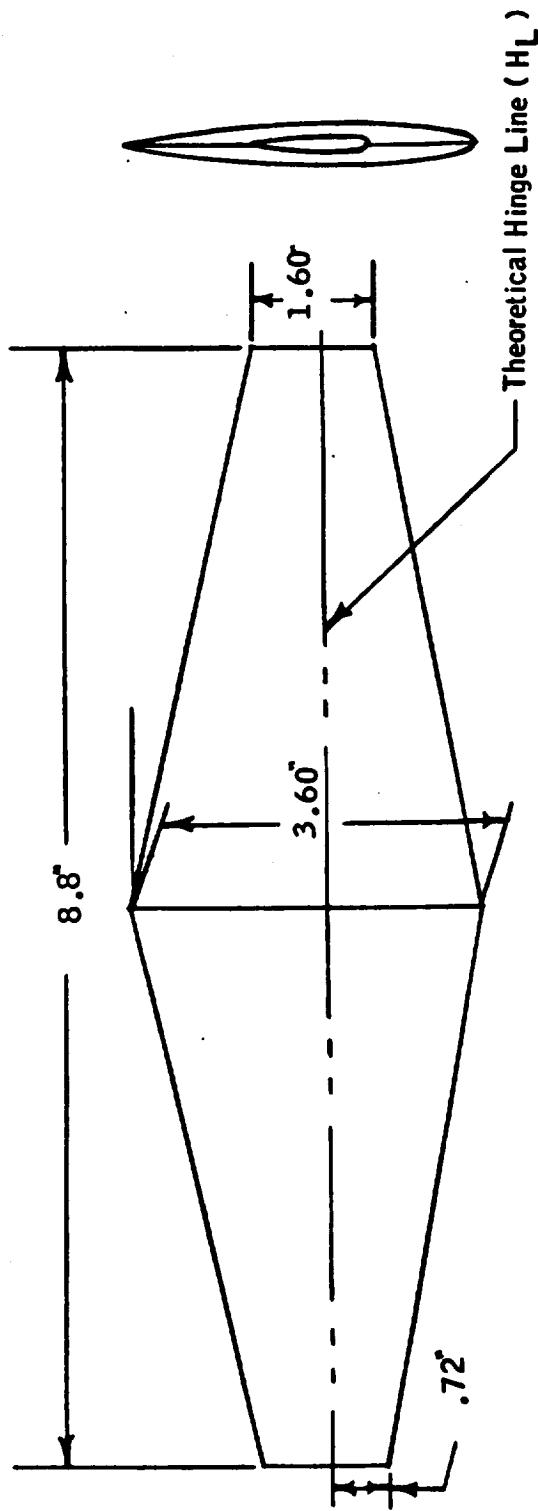


Figure 3. - Horizontal tail (H_7).

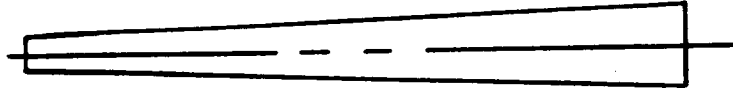
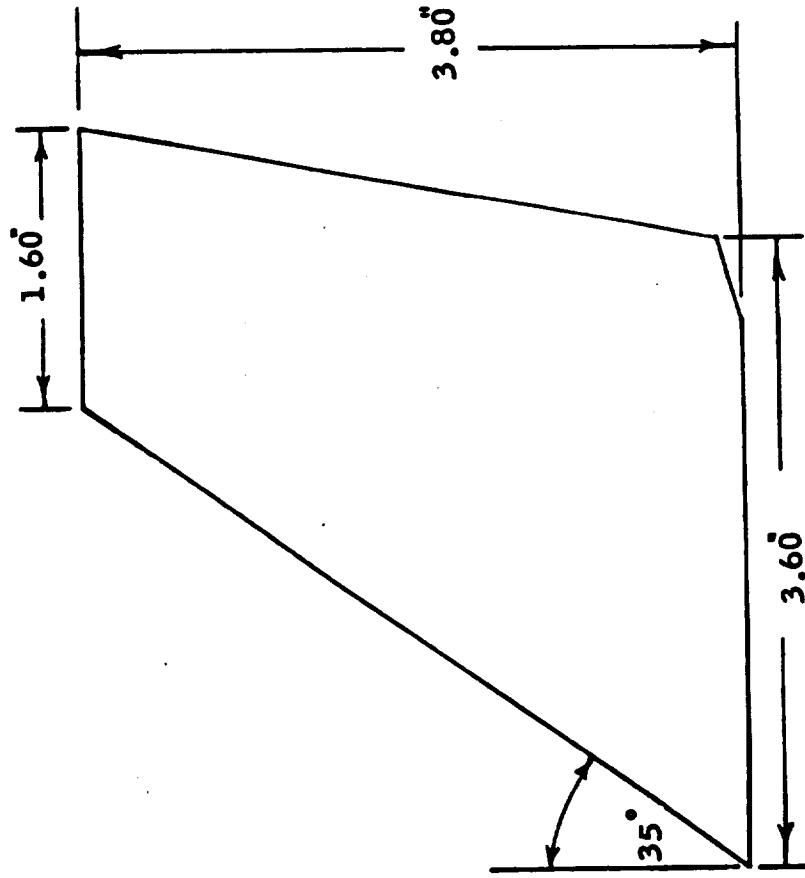


Figure 4. - Vertical Tail (V_1).

WING BLOCK WIDTH = 3.8" FOR S-1 ORB.
 WING BLOCK WIDTH = 4.32" FOR S-5 ORB.

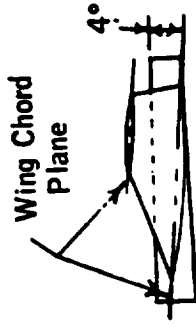
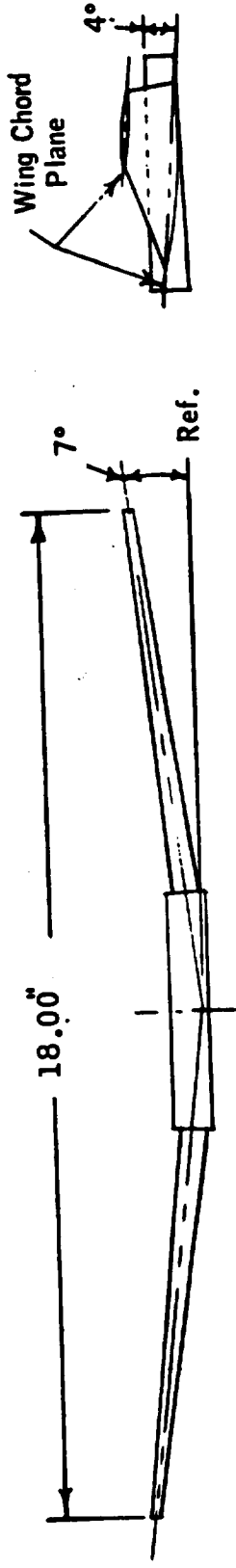
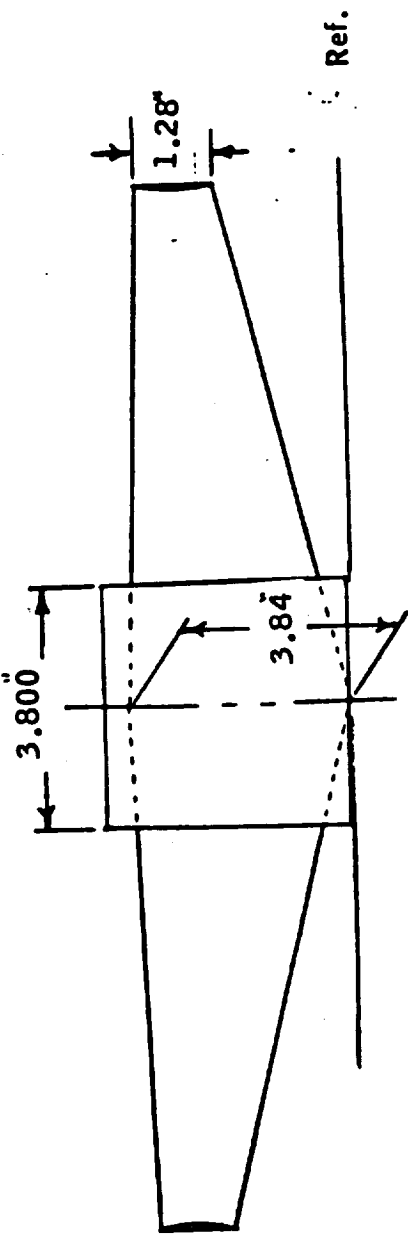
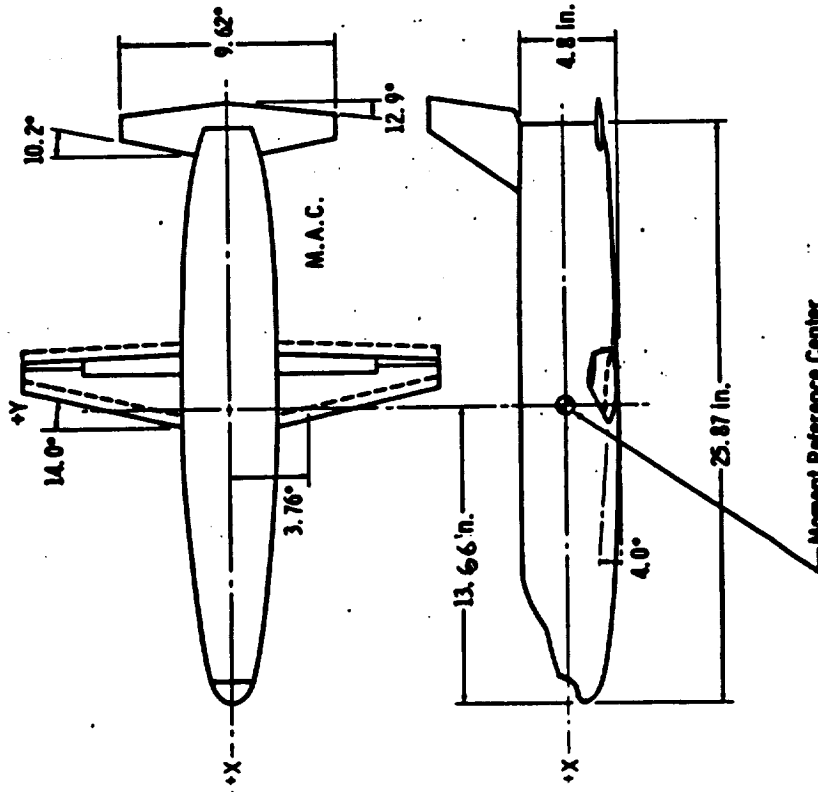


Figure 5. - Wing component (W₁).



Wing \bar{C}_D locations: FWD 53.47 percent of body length $\frac{1}{2}$ ---
AFT 62.8 percent of body length ----

*NOT APPLICABLE TO THIS DATA REPORT

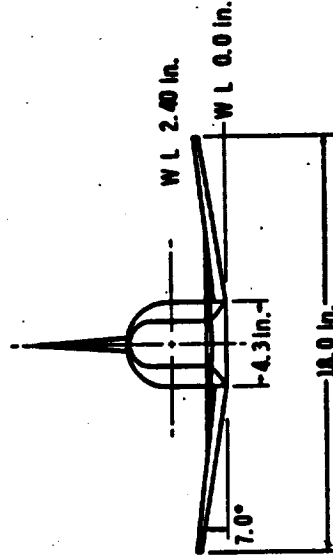


FIGURE 6: Configuration B₄W₁V₃R₆.

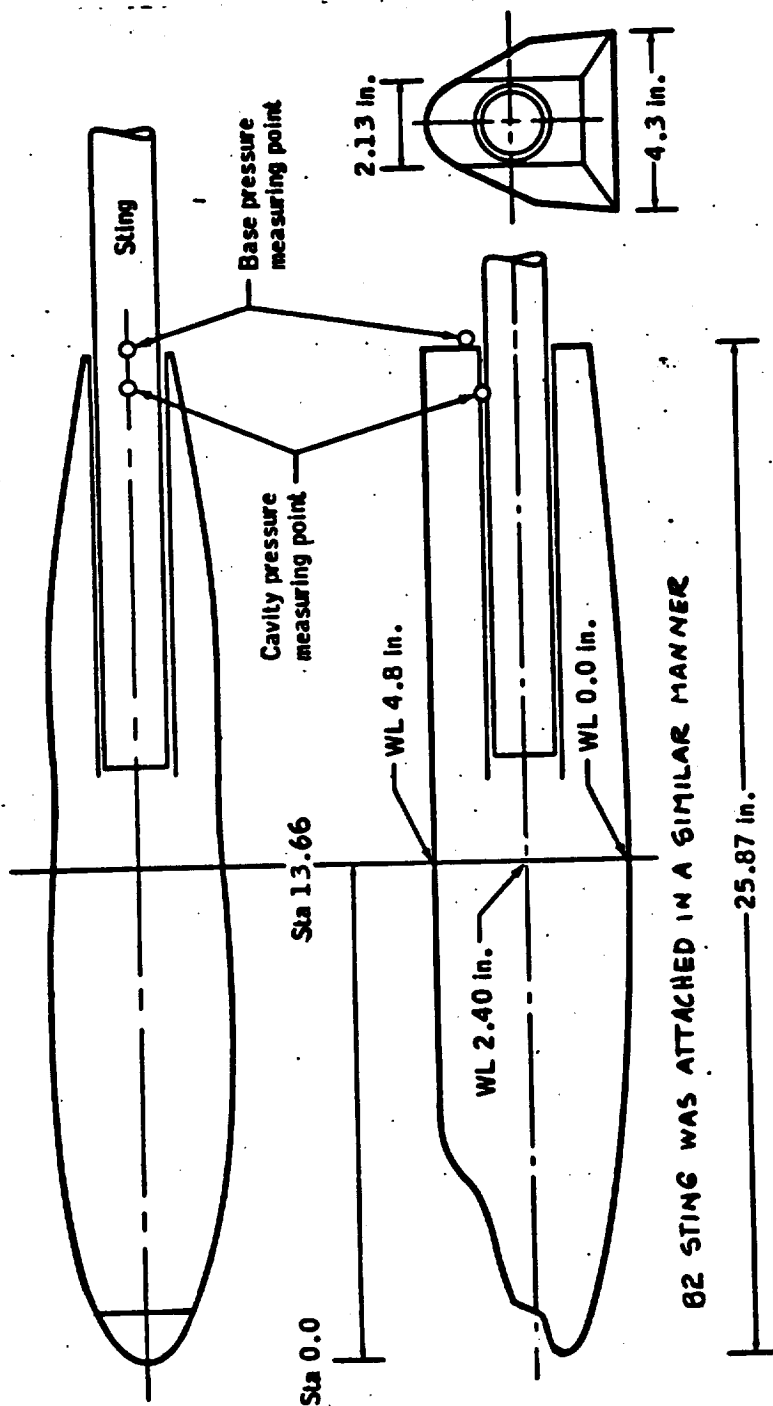


FIGURE 7. Fuselage B₄.

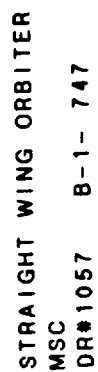


FIGURE 9. Horizontal stabilizer H₆.

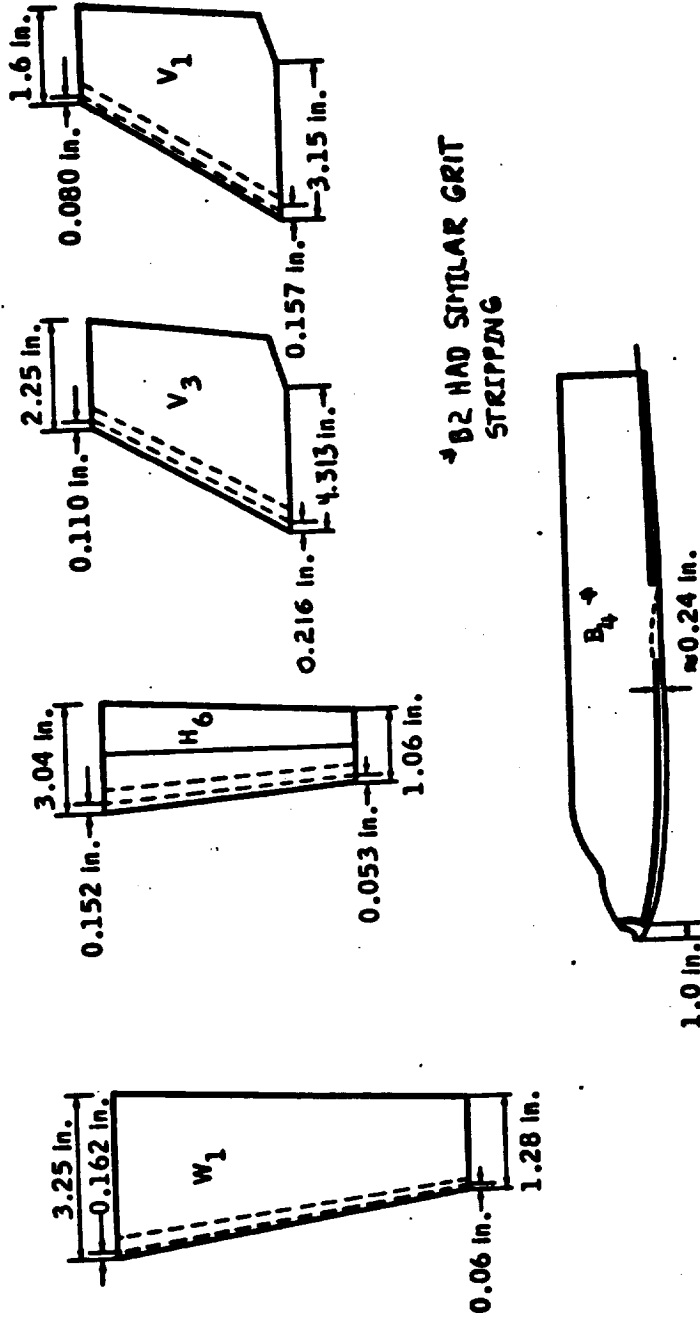


Figure 10. Grit stripping.

NASA - MSC TEST SVIII - PHASE 1 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCUD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS									
		A	B	14	16	18	20		0.25	50	52	53	54	55	56	57	58	59
RG6001	B, W ₂ H ₆ V ₃	AP	0	0	0	0	0											
002		AN	0															
003		AP	-1															
004		AN	-1															
005		AP	-5															
006		AN	-5															
007		AP	1															
008		AN	1															
009		AP	5															
010		AN	5															
011		AI	0															
012		O	B1															
013		AI	0															
014		O	B1															
015		AI	0															
016		O	B1															
017		AI	0															
018		O	B1															
019		AI	0															
020		O	B1															

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CA	CLM	CY	CYN	CBL	CPHASE	IDPVAR(1)	IDPVAR(2)	NDV					

COEFFICIENTS:
 a of B
 SCHEDULES
 a ~ A
 B ~ B

AP - 0.25, 4.5, 5.5, 6.0, 6.5, 7, 7.5, 8, 8.5, 9, 11
 AN - -13, -12.5, -12, -11.5, -11, -10.5, -10, -9.5, -9, -8.5, -8, -7.5, -6.5, -4.5, -2.5, -1, 0
 AI - -14, -10, -8, -6, -4, -2, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 20, 25
 BI - -15, -10, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 10, 15

STRAIGHT WING ORBITER
 MSC
 DR#1060 B-1- 749

STRAIGHT WING ORBITER
MSC
DR#1060 B-1- 752

ORIGINAL MADE IN
OF POOR QUALITY

NASA - MSC TEST SVIII - PHASE 1 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCAD.		CONTROL DEFLECTION				NO. of PUS.	SLASH NUMBERS									
		A	B	L/H	S ₁	S ₂	S ₃		1	2	3	4	5	6	7	8	9	10
R66061	B ₁ W ₂ H ₆ V ₃	AI	O	O	-20	O	O	0.25	127									
62		O	BI		-20				128									
63		AI	O		20				129									
64		O	BI		20				130									
65		AI	O		-25				131									
66		O	BI		-25				132									
67		AI	O		25				133									
68		O	BI		25				134									
69		AI	O		-30				135									
70		O	BI		-30				136									
71		AI	O		30				137									
72		O	BI		30				138									
73		AI	O		-2				139									
74		O	BI		-2				140									
75		AI	O		-4				141									
76		O	BI		-4				142									
77		AI	O		-6				143									
78		O	BI		-6				144									
79	B ₁ W ₂ V ₃	AI	O						145									
80		O	BI						146									

NASA - MSC TEST SVIII - PHASE I DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		CONTROL DEFLECTION			CO. of		NACH NUMBERS									
		A	B	LH	Sc	δr	δc	FIN.	147	148	149	150	151	152	153	154	155	156
081	B ₁ W ₂ H ₆	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
082	B ₁ W ₂	O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
083	B ₁ W ₂	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
084	B ₁	O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
085	B ₁	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
086	B ₁ V ₃ H ₆	O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
087	B ₁ V ₃ H ₆	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
088		O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
089		AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
090		O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
091		AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
092		O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
093	B ₁ W ₂ H ₆ V ₃ S _{2.5}	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
094	B ₁ W ₂ H ₆ V ₃ S _{2.5}	O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
095	B ₁ W ₂ H ₆ V ₃ S _{2.5}	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
096	B ₁ W ₂ H ₆ V ₃ S _{2.5}	O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
097	B ₁ W ₂ H ₆ V ₃ S _{2.5}	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
098	B ₁ W ₂ H ₆ V ₃ S _{2.5}	O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
099	B ₁ W ₂ H ₆ V ₃ S _{2.5}	AI	O	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156
100	B ₁ W ₂ H ₆ V ₃ S _{2.5}	O	BI	0	0	0	0	0	147	148	149	150	151	152	153	154	155	156

STRAIGHT WING ORBITE
 MSC
 DR#1060 B-1- 753

NASA - MSC TEST SVIII - PHASE 1 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHEM.		CONTROL DEFLECTION				NO. OF PINS	PITCH NUMBERS									
		A	B	LH	SH	ST	SC		1	2	3	4	5	6	7	8	9	10
RG6 101	B ₁ W ₂ H ₆ V ₃ S _{3.5}	A1	O	O	O	O	O	167	167									
102	B ₁ W ₂ H ₆ V ₃ S _{3.7}	O	B1					168	168									
103	B ₁ W ₂ H ₆ V ₃ S _{3.7}	A1	O					169	169									
104	B ₁ W ₂ H ₆ V ₃ S _{4.5}	O	B1					170	170									
105	B ₁ W ₂ H ₆ V ₃ S _{4.5}	A1	O					171	171									
106	B ₁ W ₂ H ₆ V ₃ S _{4.7}	O	B1					182	182									
107	B ₁ W ₂ H ₆ V ₃ S _{4.7}	A1	O					190	190									
108	B ₁ W ₂ H ₆ V ₃ S _{5.5}	O	B1					181	181									
109	B ₁ W ₂ H ₆ V ₃ S _{5.5}	A1	O					173	173									
110	B ₁ W ₂ H ₆ V ₃ S _{6.5}	O	B1					174	174									
111	B ₁ W ₂ H ₆ V ₃ S _{6.5}	A1	O					176	176									
112	B ₁ W ₂ H ₆ V ₃ S _{6.7}	O	B1					177	177									
113	B ₁ W ₂ H ₆ V ₃ S _{6.7}	A1	O					178	178									
114	B ₁ W ₂ H ₆ V ₃ S _{5.5}	O	B1					179	179									
115	B ₁ W ₂ H ₆ V ₃ S _{5.5}	A1	O					183	183									
116	B ₁ W ₂ H ₆ V ₃ S _{5.5}	O	B1					184	184									
117	B ₁ W ₂ H ₆ V ₃ S _{5.5}	A1	O					185	185									
118		O	B1					186	186									
119		A1	O					187	187									
120		O	B1					188	188									

CN L CA L CUN L CV L CYL L CBL L CBASH

ORIGINAL PAGE IS
OF POOR QUALITY

NASA - MSC TEST SVIII - PHASE 1 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHEM.		CONTROL DEFLECTION				NO. of PUSH	MACH NUMBERS				
		A	B	L/H	S ₁	S ₂	S ₃		0.25				
RG6 121	B ₁ W ₂ H ₆ V ₃ S ₅ SL	A1	O	O	0	0	20	45.6	189				
122		O	B1						190				
123		A1	O						191				
124		O	B1						192				
125		A1	O						193				
126		O	B1						194				
127		A1	O						195				
128		O	B1						196				
129		A1	O						197				
130		O	B1						198				
131		A1	O						199				
132		O	B1						200				
133		A1	O						201				
134		O	B1						202				
135		A1	O						203				
136		O	B1						204				
137		A1	O						205				
138		O	B1						206				
139	B ₂ W ₂ H ₆ V ₃ L	A1	O						207				
140		O	B1						208				

STRAIGHT WING ORBITER
MSC
DR#1060 B-1- 755

NASA - MSC TEST SVIII - PHASE 1 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		CONTROL DEFLECTION				MACH NUMBERS									
		A	B	L/H	S/C	S/F	S/C	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1
RG6 141	B ₁ W ₂ H ₆ V ₃ L	A1	O	0	5	20	45	209									
142		O	B1		-5			210									
143		A1	O					211									
144		O	B1					212									
145		A1	O			0		213									
146		O	B1					214									
147		A1	O		-15			215									
148		O	B1					216									
149		A1	O		-30			217									
150		O	B1			10		218									
151		A1	O					219									
152		O	B1			20		220									
153		A1	O					221									
154		O	B1					222									
155		A1	O				0	223									
156		O	B1					224									
157		A1	O			10		225									
158		O	B1					226									
159		A1	O		-5	20		227									
160		O	B1					228									

ORIGINAL PAGE IS
OF POOR QUALITY

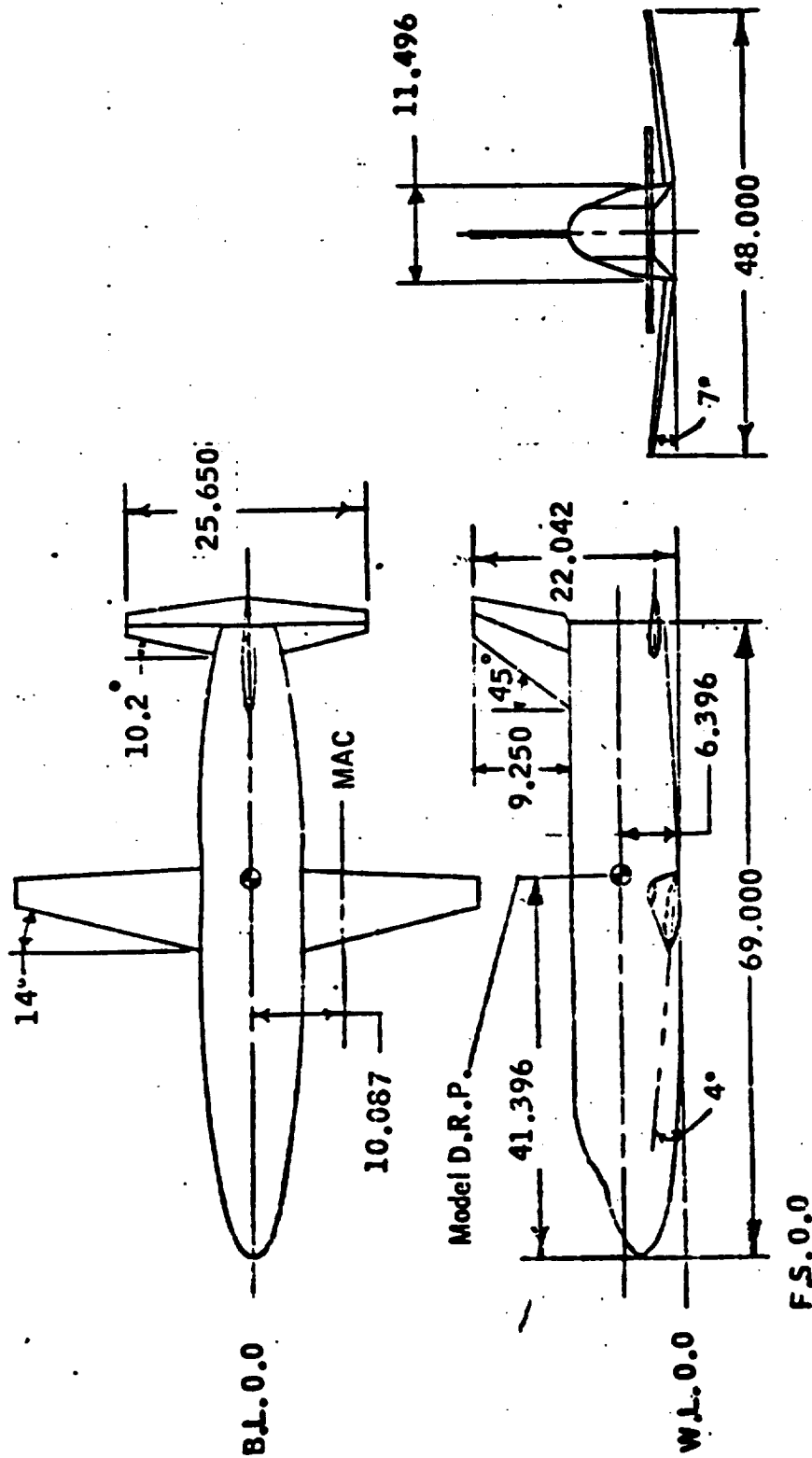


Figure 3 - Model geometry. Configuration B₁W₂H₆V₃ (all dimensions in inches)

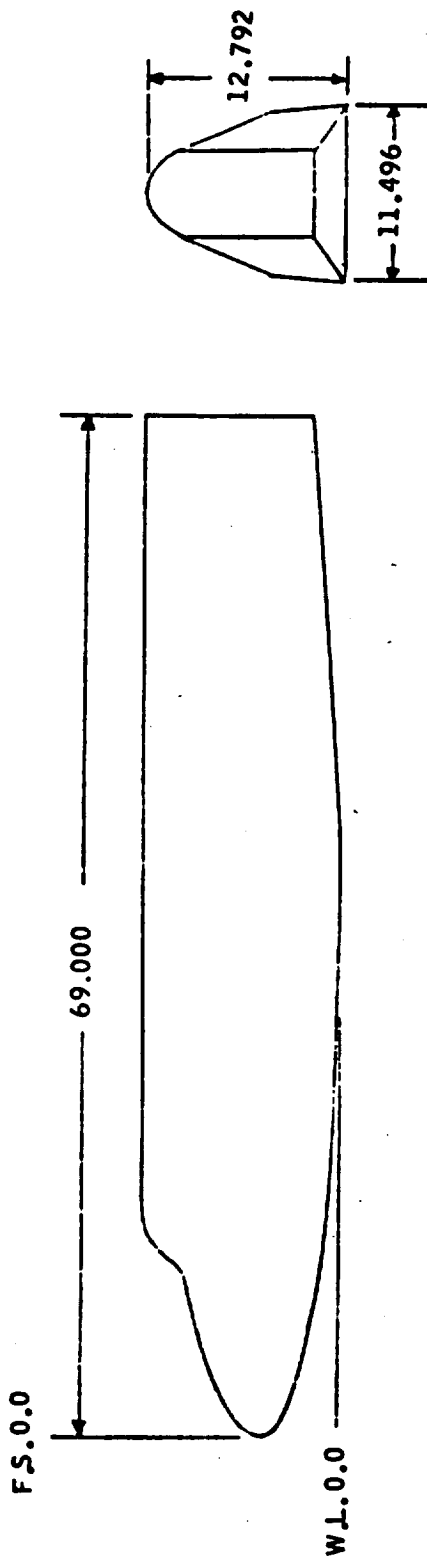
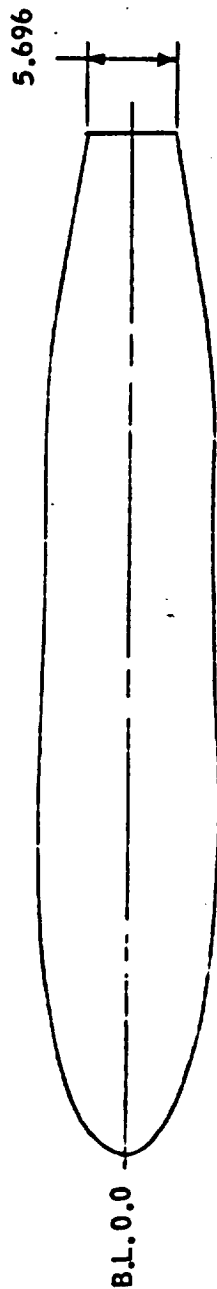


Figure 4 - Fuselage B₁ (all dimensions in inches)

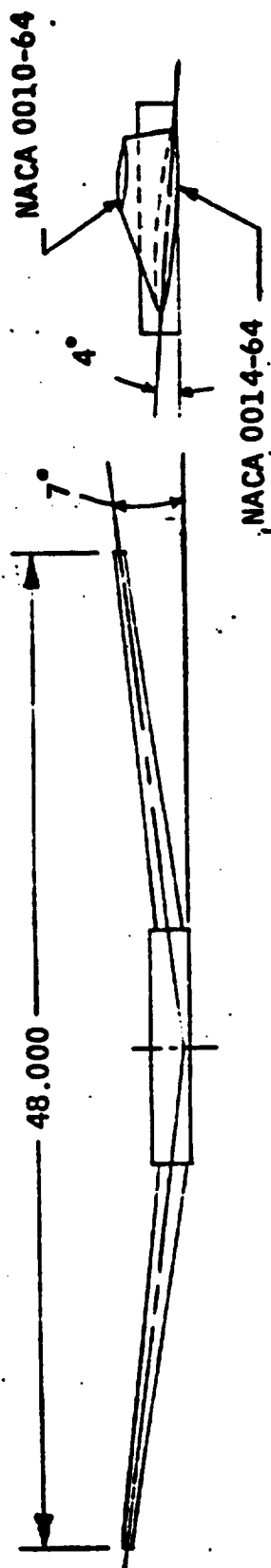
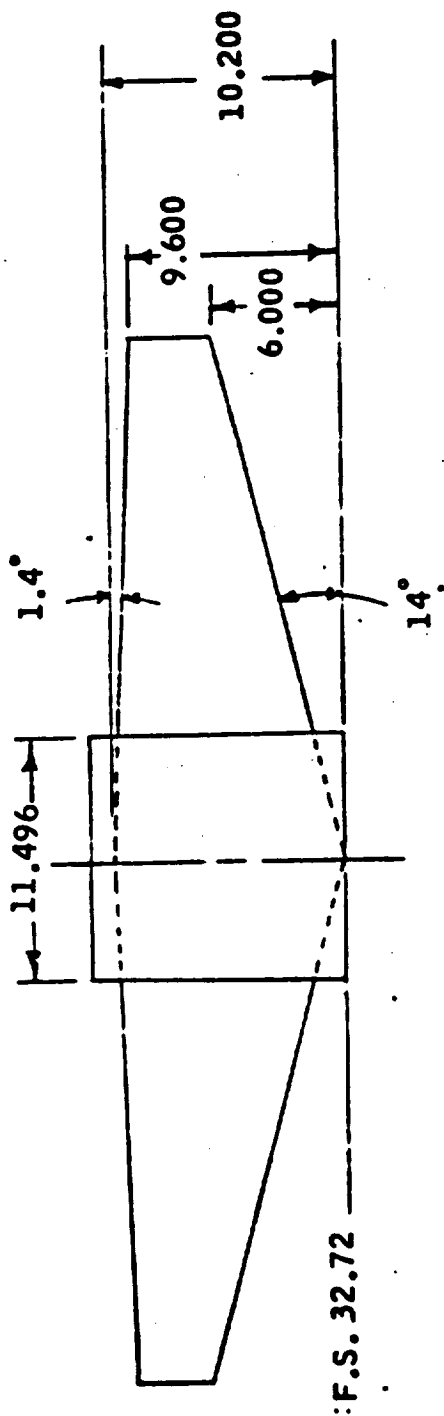


Figure 5 - Wing W₂ (all dimensions in inches)

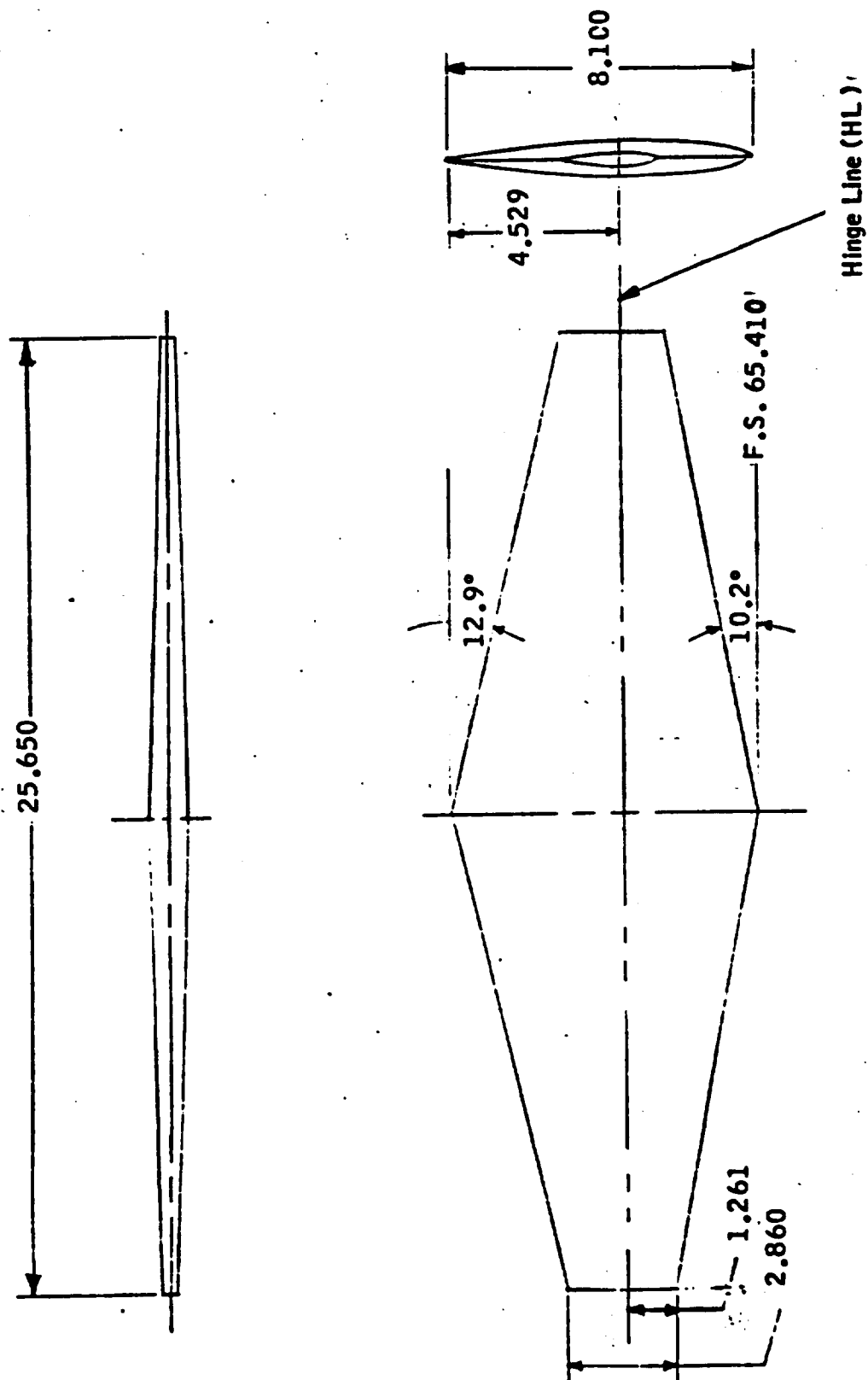


Figure 6 - Horizontal tail H_6 (all dimensions in inches)

STRAIGHT WING ORBITER
MSC
DR#1060 B-1- 761

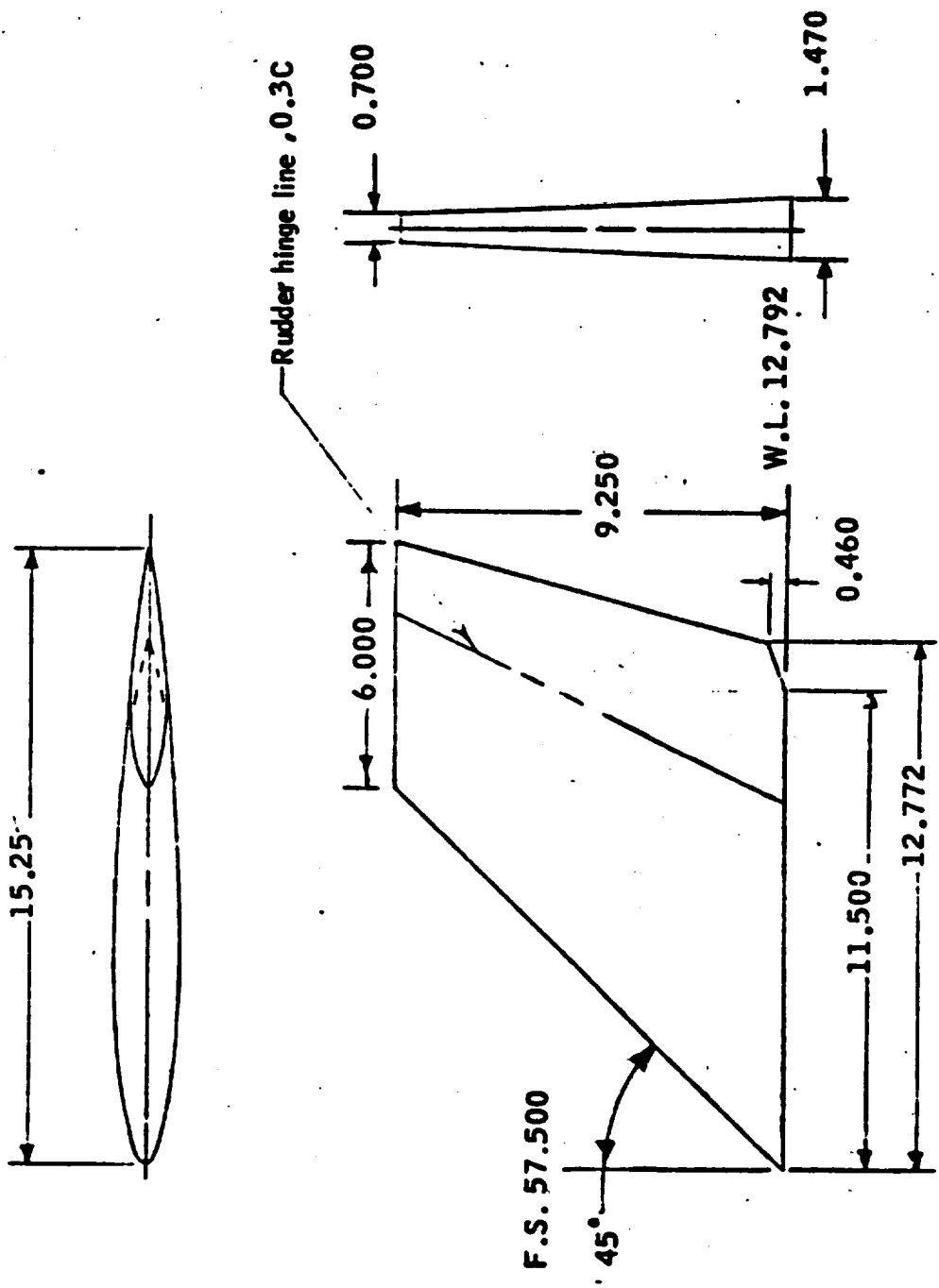


Figure 7 - Vertical Tail V3 (all dimensions in inches)

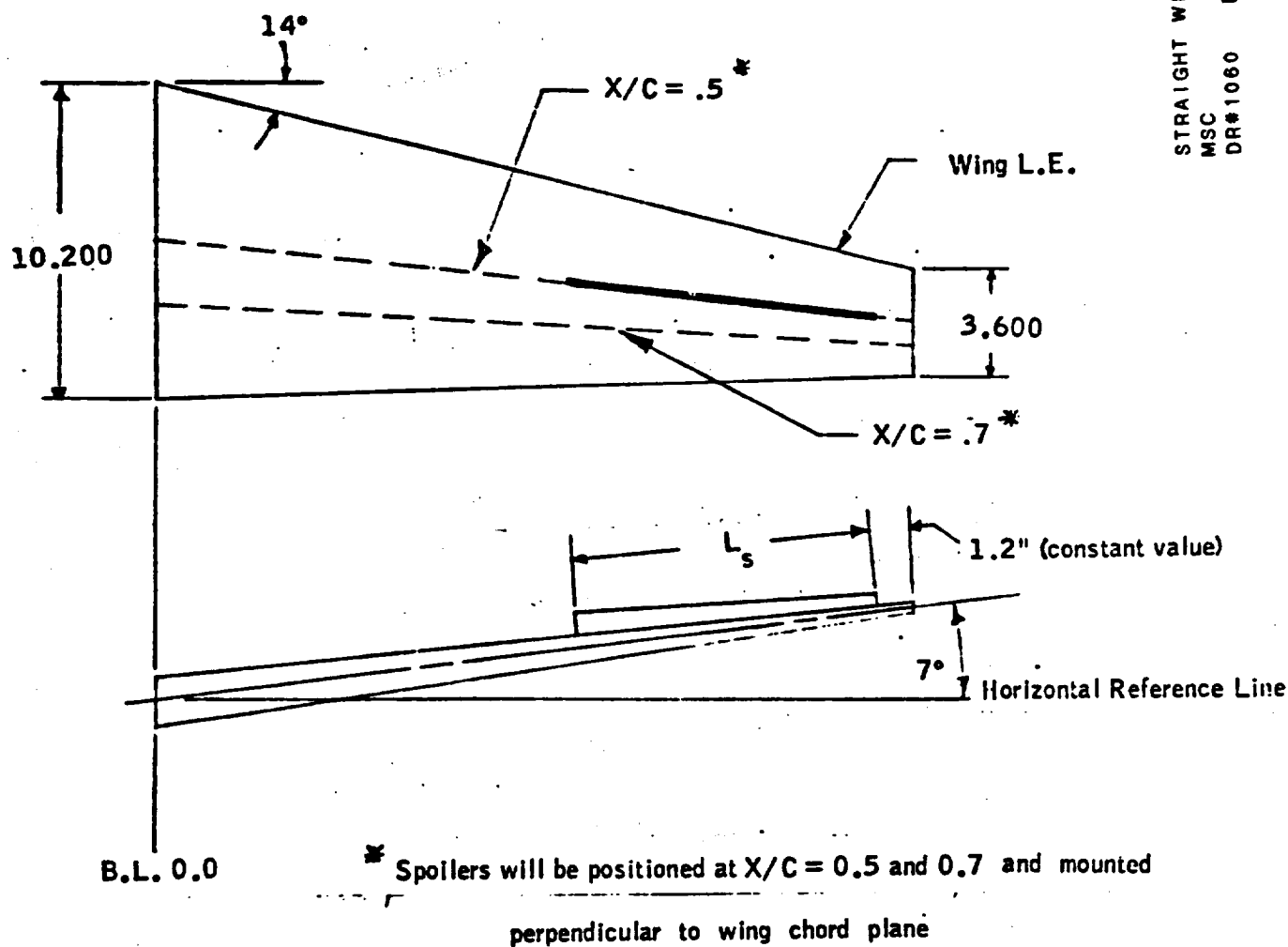


Figure 8 - Spoiler configuration. (all dimensions in inches)

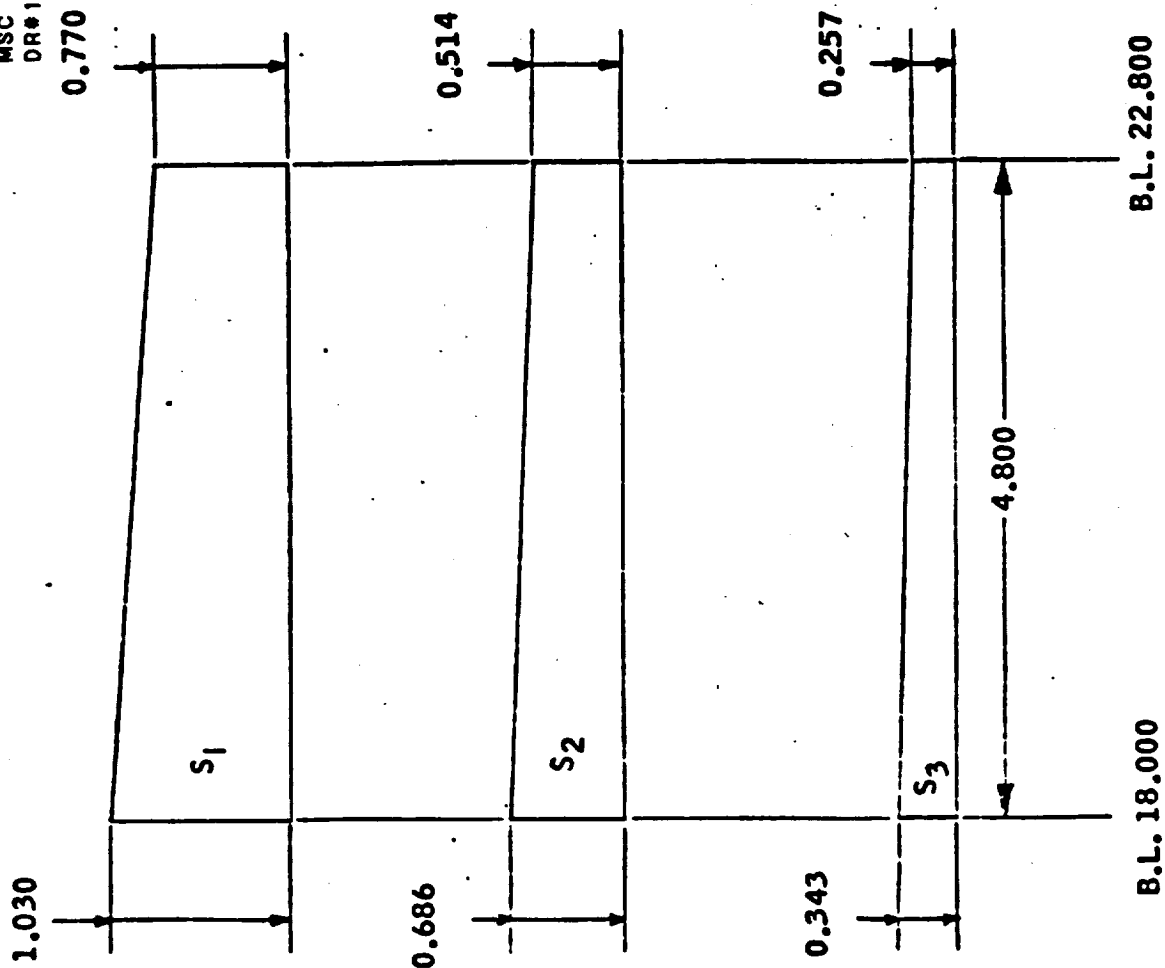
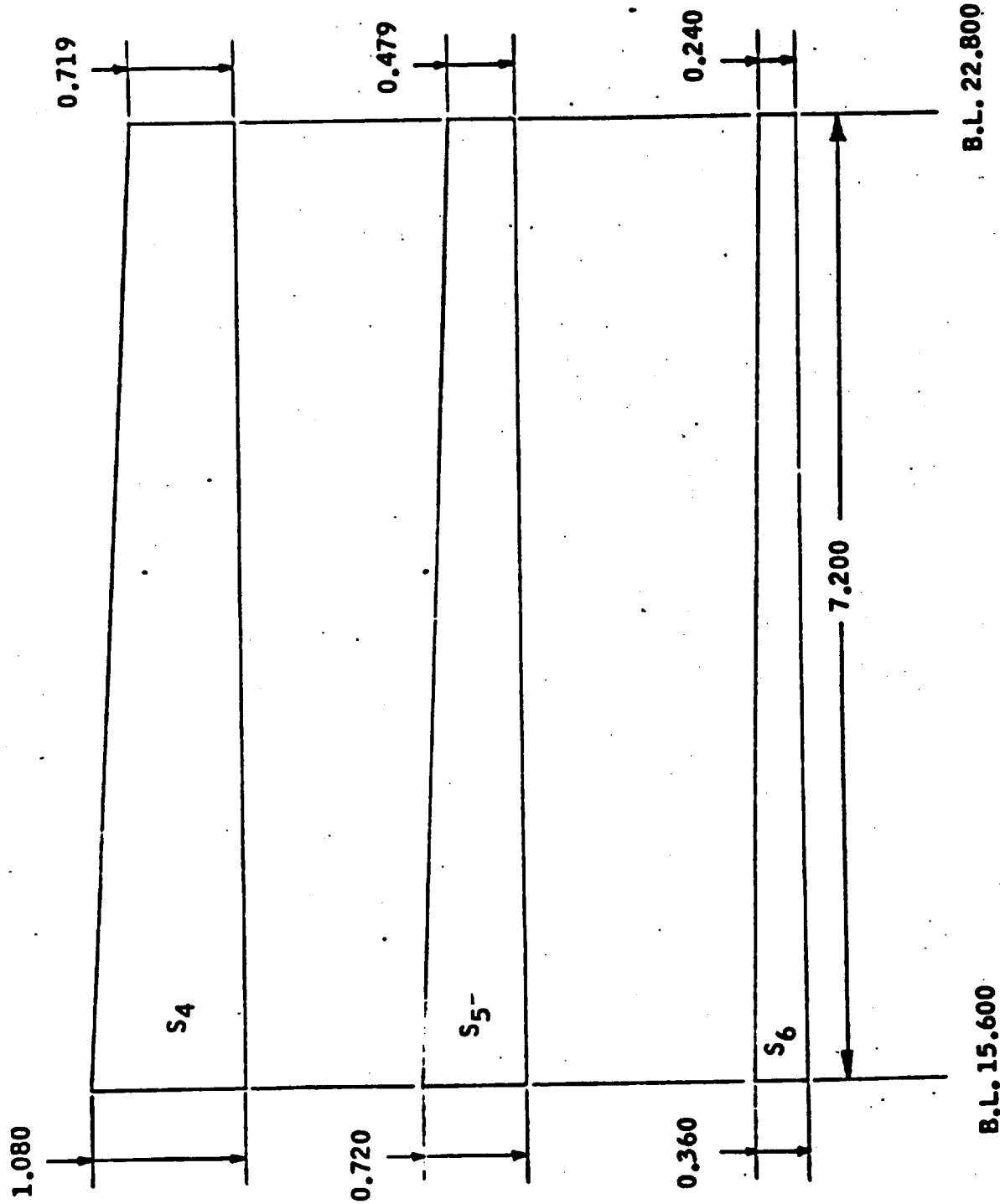


Figure 9 - Model Spoilers (all dimensions in inches)



STRAIGHT WING ORBITER
MSC
DR#1060 B-1- 765

867

Figure 9 - Continued:

STRAIGHT WING ORBITER
MSC
DR#1060 B-1- 766

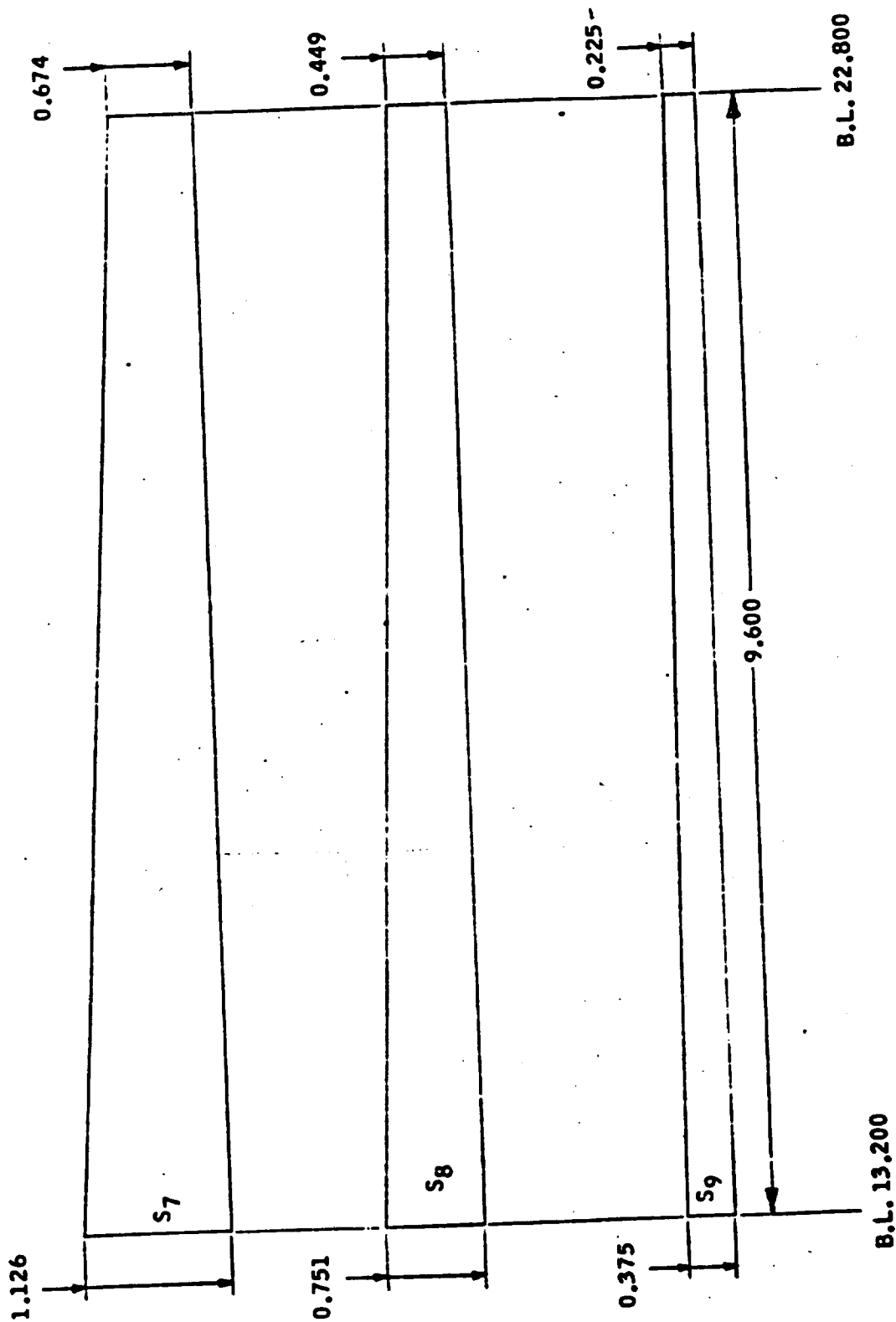


Figure 9 - Concluded.

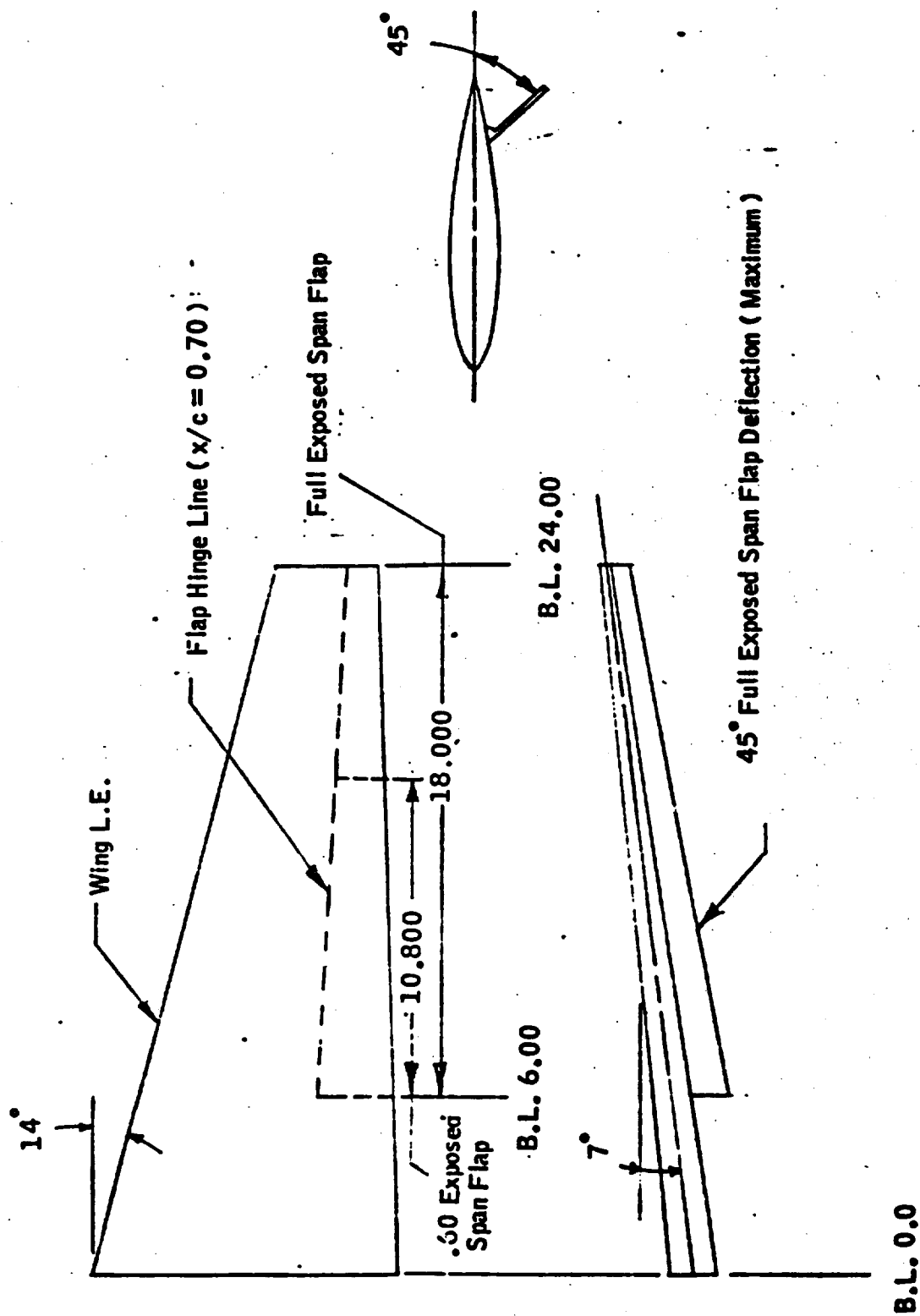


Figure 10 - Flap configuration. (all dimensions in inches)

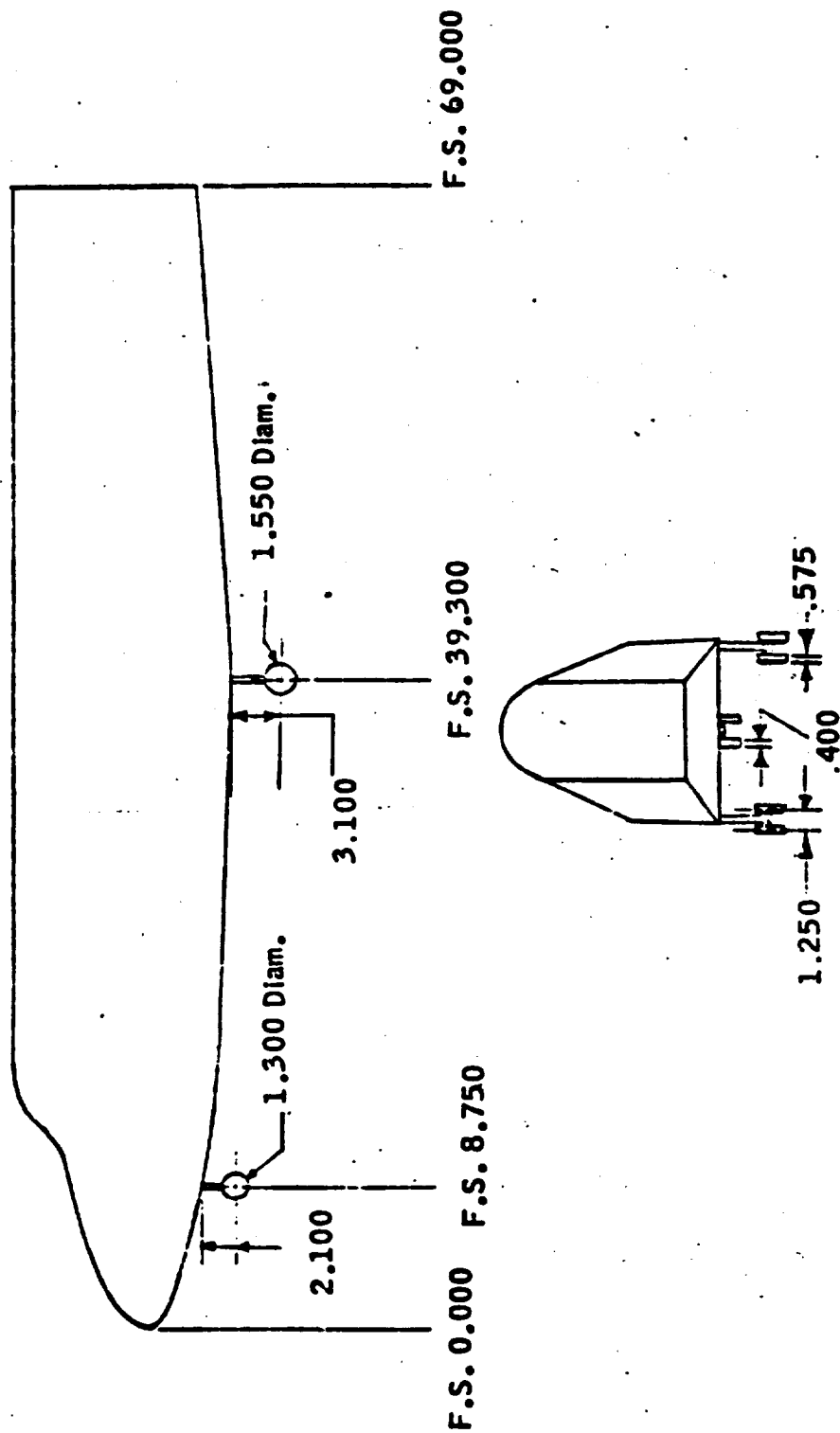


Figure 11. - Landing gear configuration. (all dimensions in inches)

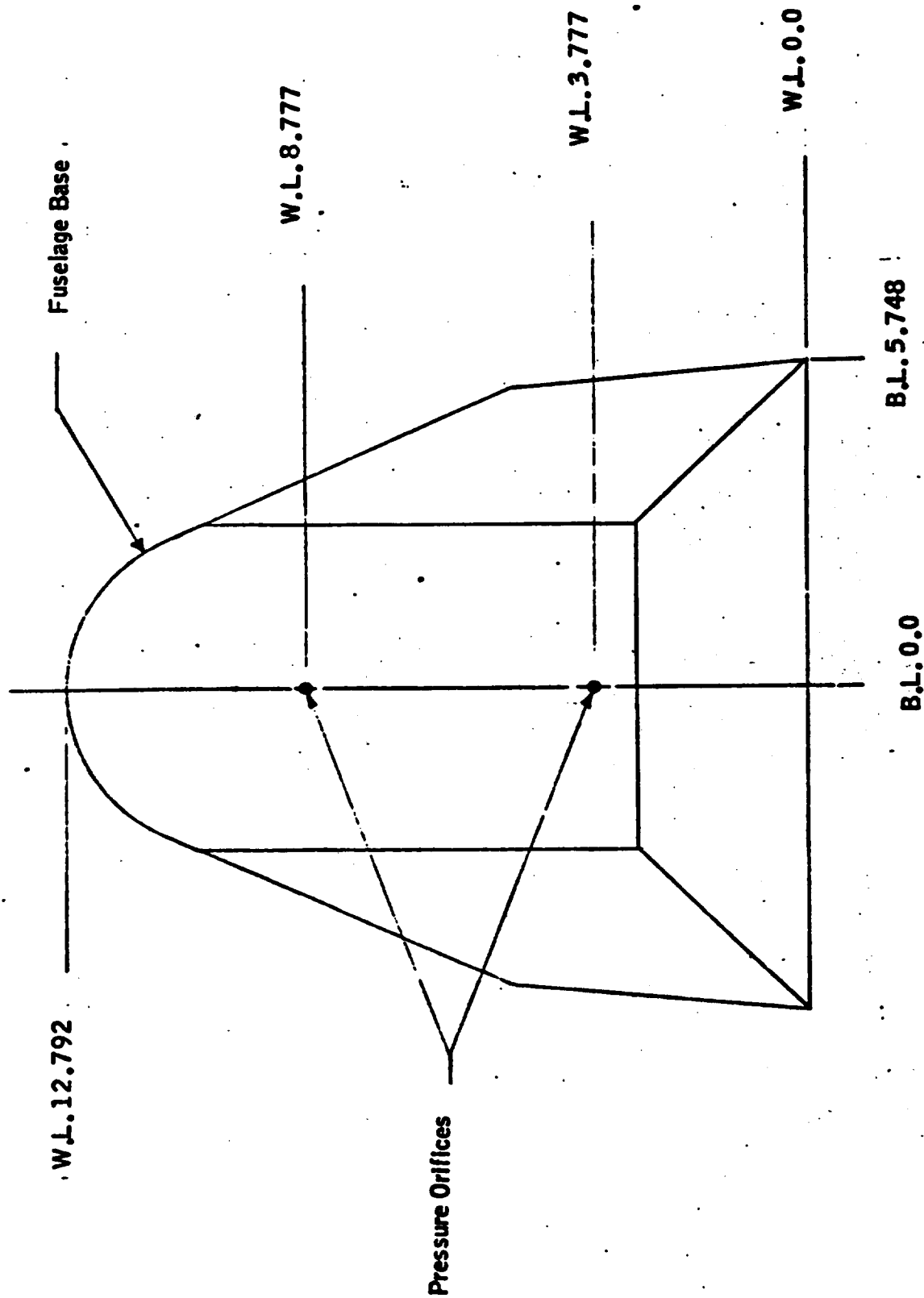


Figure 1e. - Model Pressure Orifices (all dimensions in inches)

STRAIGHT WING ORBITER
MSC
DR#1060 B-1- 769

TEST S-38 DATA SET COLLATION SHEET

ORIGINAL PAGE IS
OF POOR QUALITY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCALING	CONTROL DEFLECTION		NO. OF RUNS	MIX NUMBERS																			
			1	2		0.25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
RG1002	B1W1 H6	A-5			1																				
03	B1W1 H6	A-10																							
04	B1W1 H6	10 B																							
05	B1W1 H6	8 B																							
06	B1W1 H6	6 B																							
07	B1W1 H6	4 B																							
08	B1W1 H6	2 B																							
09	B1W1 H6	0 B																							
10	B1W1 H6 U111	0 B																							
11	U111	2 B																							
12	U111	4 B																							
13	U111	6 B																							
14	U111	8 B																							
15	U111	10 B																							
16	U102	10 C																							
17	U102	2 C																							
18	U120	2 C																							
19	U120	10 C																							
20	U101	2 C																							

CA. EX 13 19 25 31 37 43 49 55 61 67 7576

COEFFICIENTS: A $\alpha = 0.2, 4, 6, 8, 10$
 B $\beta = 0.2, 4, 6, 8, 10$
 C $\gamma = 0.2, 4, 6, 8, 10$

SCHEMATIC: 1 2 3 4 5 6 7 8 9 10

ORIGINAL PAGE IS
OF POOR QUALITY

TEST S-38 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCUD.		CONTROL DEFLECTION				NO. OF RUNS	MACH NUMBERS									
		1	2	AREA	AZ	15	15		0.25									
2570 21	B161146 V103	2	C	200.5	45	30	1	1	21									
22	V104					30	0		22									
23	V105					30	15		23									
24	V106					30	30		24									
25	V107					15	0		25									
26	V108					15	15		26									
27	V109					0	0		27									
28	V110					45	0		28									
29	V112					45	30		29									
30	V113					30	0		30									
31	V114					30	15		31									
32	V115					20	30		32									
33	V116					15	0		33									
34	V117					15	15		34									
35	V118					0	0		35									
36	V119					2	45	0	36									
37	V121					45	30		37									
38	V122					30	0		38									
39	V123					30	15		39									
40	V124					30	30		40									

7 13 19 25 31 37 43 49 55 61 67 7576

CA EX. EN. COL. COL. SYN. IDPVAR(1) IDPVAR(2) NDV

COEFFICIENTS: A $\alpha = 0.2, 4, 6, 8, 10$
B $\beta = -10, -8, -6, -4, -2, 0, 2, 4, 6, 8, 10$
C $\beta = 0.2, 4, 6, 8, 10$

STRAIGHT WING ORBITER
MSC
DR#1062 B-1-771

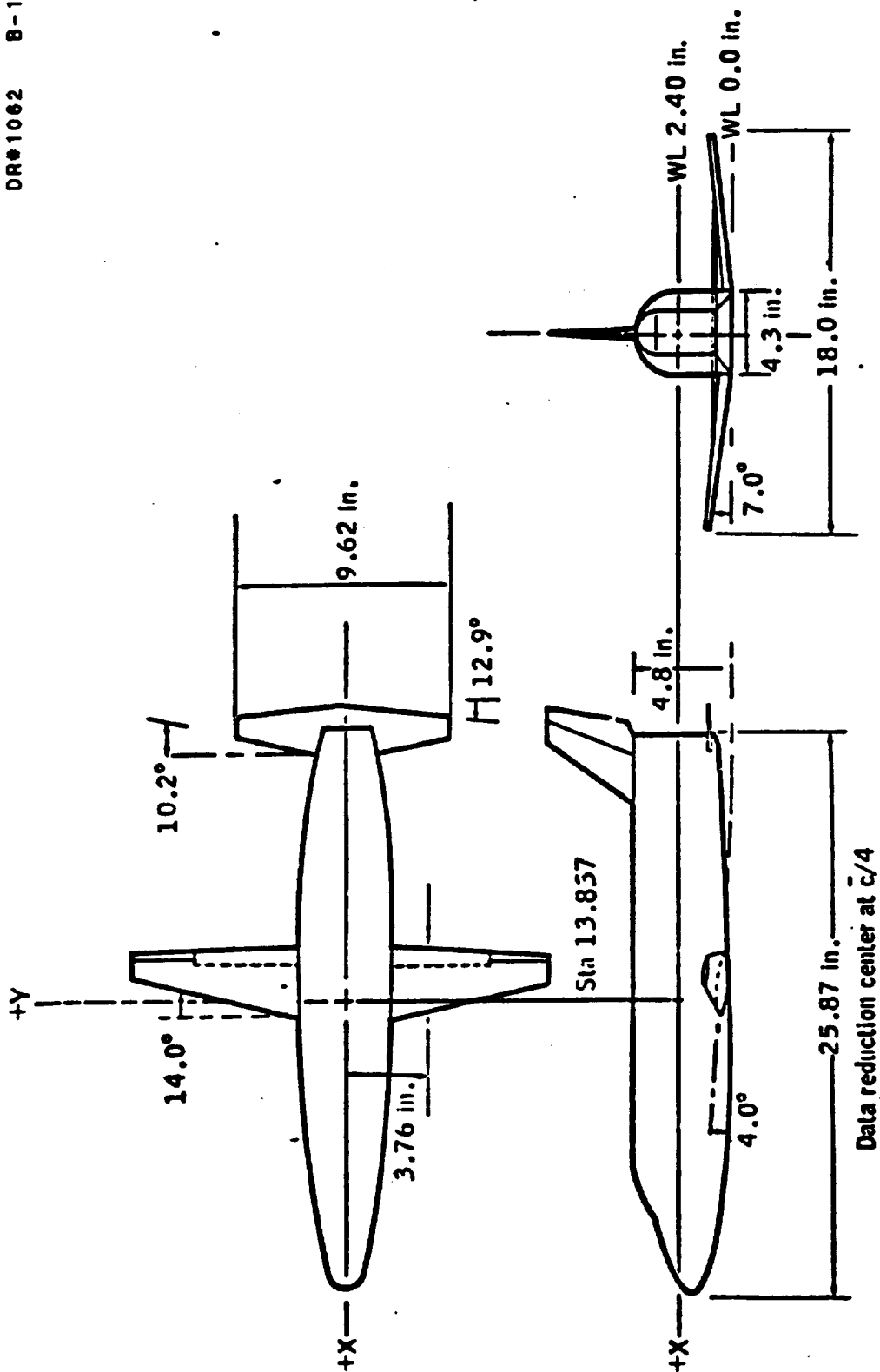
TEST S-38 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

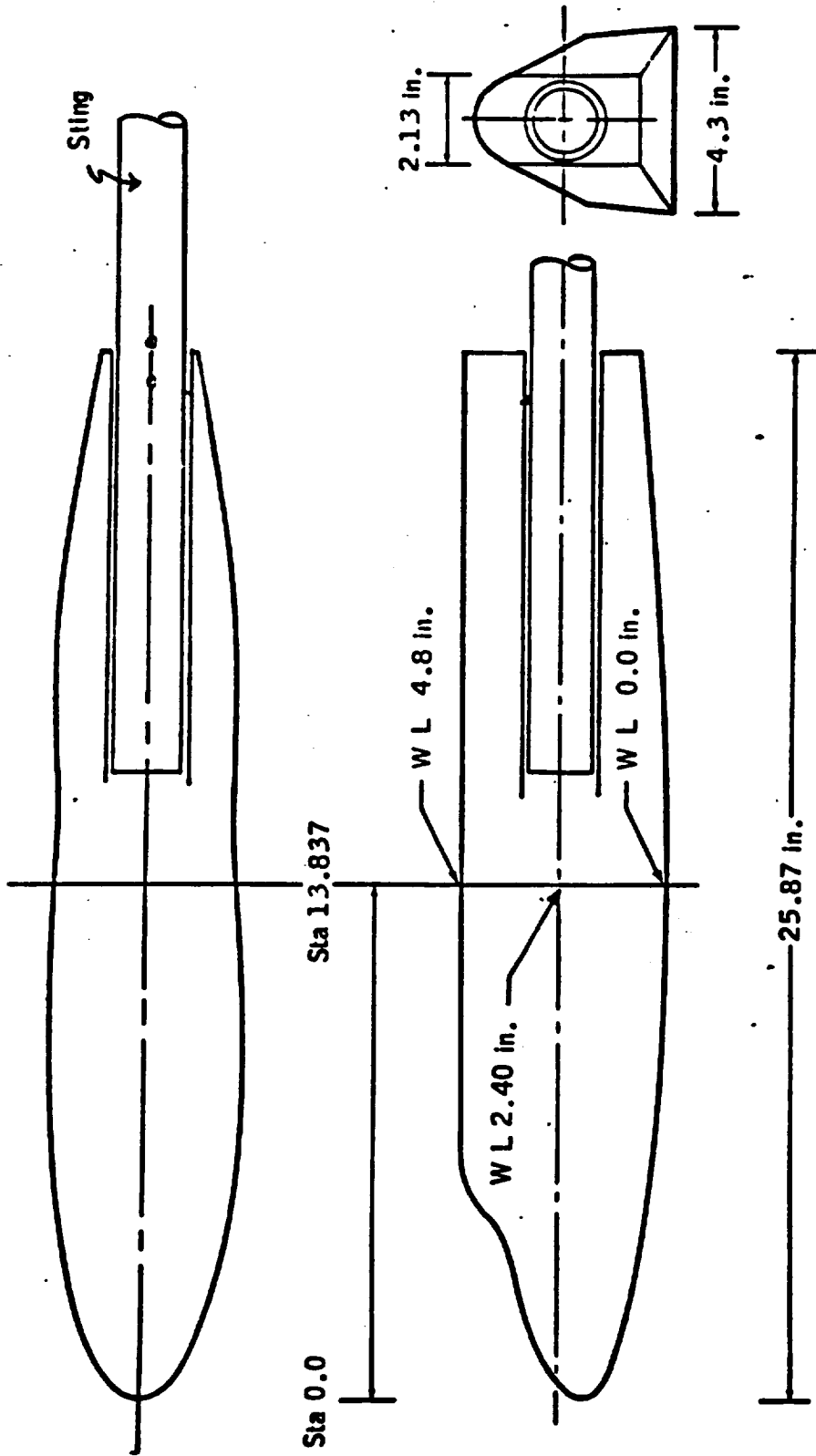
DATA SET IDENTIFIER	CONFIGURATION	SC.D. CONTROL DEFLECTION		NO. OF RUNS	MACH NUMBERS									
		1	2		0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70
41	DIVING V125	2	C	200	2	15	0	1	41					
42	V126			200	2	15	15		42					
43	V127			200	2	0	0		43					
44	V128			100	1	0	0		44					
45	V129			300	1	0	0		45					
46	V130			500	1	0	0		46					
47	V131			200	1	45	15		47					
48	V3		B	240	1	45	15		48					
49	V102		C	200	5	45	15		49					
50	V111			200	1	45	15		50					
51	V114			200	1	30	15		51					
52	V117			200	1	15	15		52					
53	V120			200	2	45	15		53					
54	V133			300	1	45	15		54					
55	V134			300	2	45	15		55					
56	V135			400	1	45	15		56					
57	V136			400	2	45	15		57					
58	V137			500	1	45	15		58					
59	V138			500	2	45	15		59					
60	V139			600	1	45	15		60					

1	7	13	19	25	31	37	43	49	55	61	67	73	79
CA	15	15	15	15	15	15	15	15	15	15	15	15	15
COEFFICIENTS:	IDPVAR(1) IDPVAR(2) INDV												
a or b	A = 0.2, 4, 6, 8												
SCHEDULES	B = -10, -8, -6, -4, -2, 0, 2, 4, 6												
	C = 0.2, 4, 6, 8												



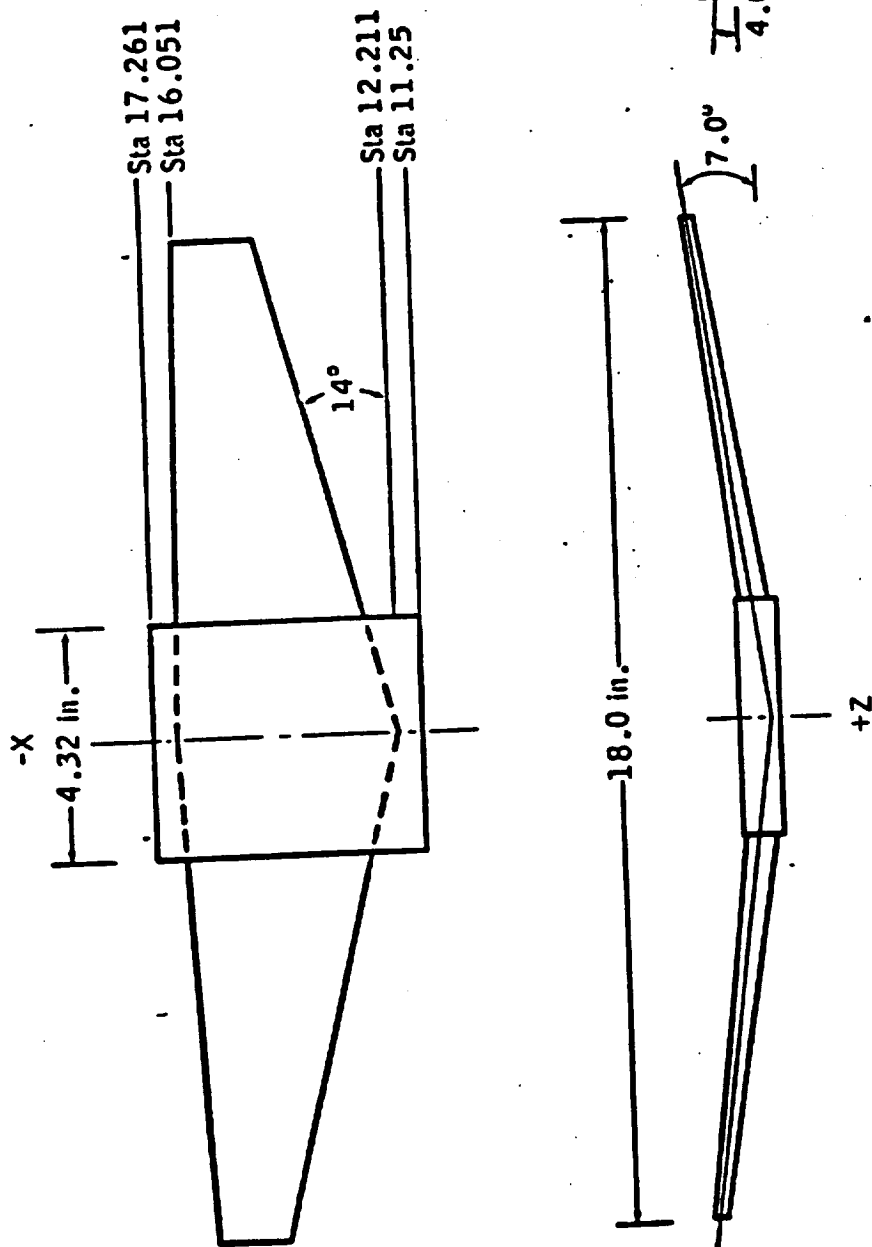
(a) Configuration $B_1 V_1 V_3 H_6$.

Figure 1.- Model S-5, 0.01875 scale model of the MSC orbiter shuttle base-line configuration.



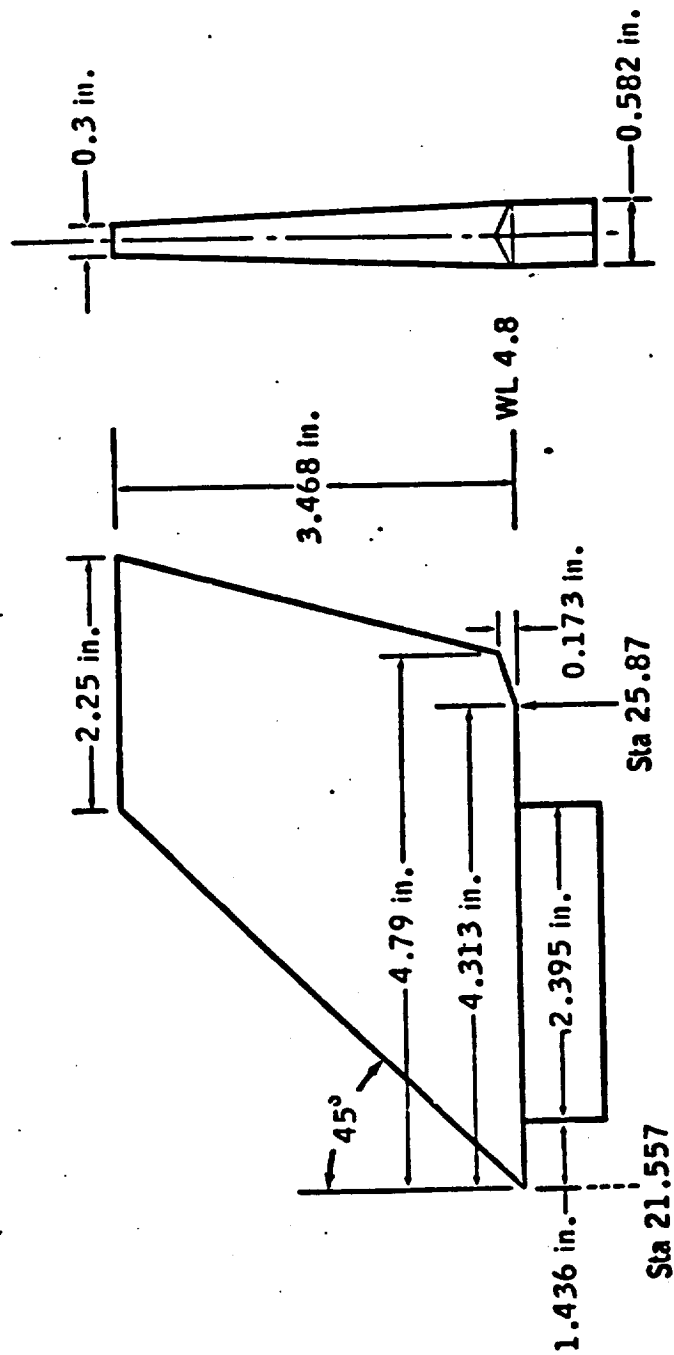
(b) Fuselage (B_1).

Figure 1.- Continued.



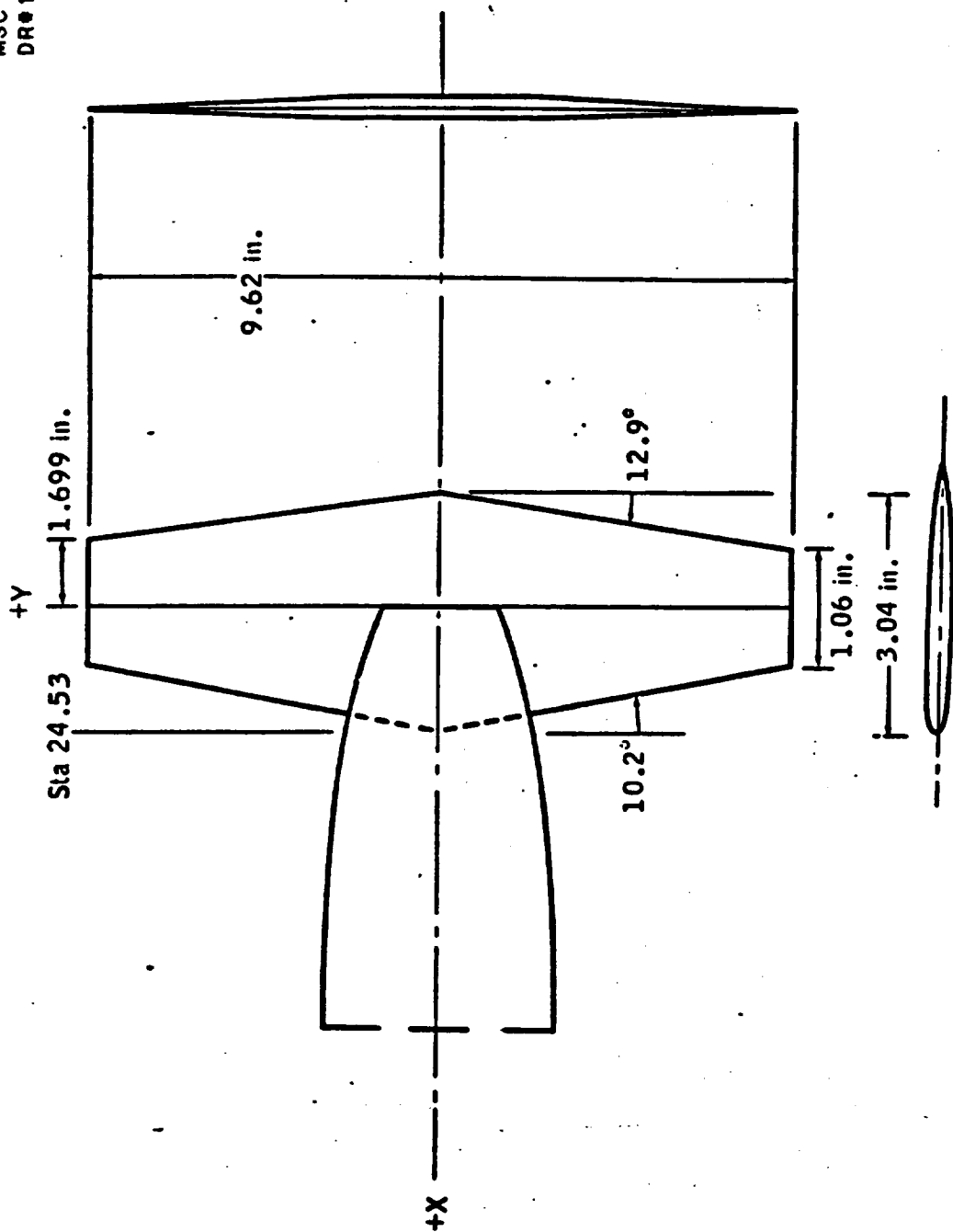
(c) Wing (W_1).

Figure 1.- Continued.



(d) Vertical stabilizer (V₃).

Figure 1.- Continued.



(e) Horizontal stabilizer (H₆).

Figure 1.- Concluded.

TEST S-39 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	HORIZONTAL TAIL PARAMETERS				MACH NUMBERS			
			AR	LE	LE	VERTICAL POSITION	0.25	1	2	3
RG-20 01	B ₁ W ₁ V ₃	B 0	334	2.0	10.2	0°				
02	B ₁ W ₁ V ₃ H _{6c}	↑	↓	↓	↓	↓				
03	H _{43c}	↑	↓	↓	↓	↓				
04	H _{44c}	↑	↓	↓	↓	↓				
05	H _{45c}	↑	↓	↓	↓	↓				
06		B	↓	↓	↓	↓				
07	H _{23A}	A	300	2.0	15	0				
08	H _{24A}	↑	↓	↓	↓	↓				
09	H _{25A}	↑	↓	↓	↓	↓				
10	H _{26A}	↑	↓	↓	↓	↓				
11	H _{27A}	↑	↓	↓	↓	↓				
12	H _{28A}	↑	↓	↓	↓	↓				
13	H _{29A}	↑	↓	↓	↓	↓				
14	H _{30A}	↑	↓	↓	↓	↓				
15	H _{31A}	↑	↓	↓	↓	↓				
16	H _{32A}	↑	↓	↓	↓	↓				
17		↑	↓	↓	↓	↓				
18		↑	↓	↓	↓	↓				
19		↑	↓	↓	↓	↓				
20	H _{51A}	↑	↓	↓	↓	↓				

CA CY CN CR CL CM CVN IDPVAR(1) IDPVAR(2) INDV

STRAIGHT WING ORBITER
MSC
DR#1073 B-1- 779

2.

TEST S-39 DATA SET COLLATION SHEET

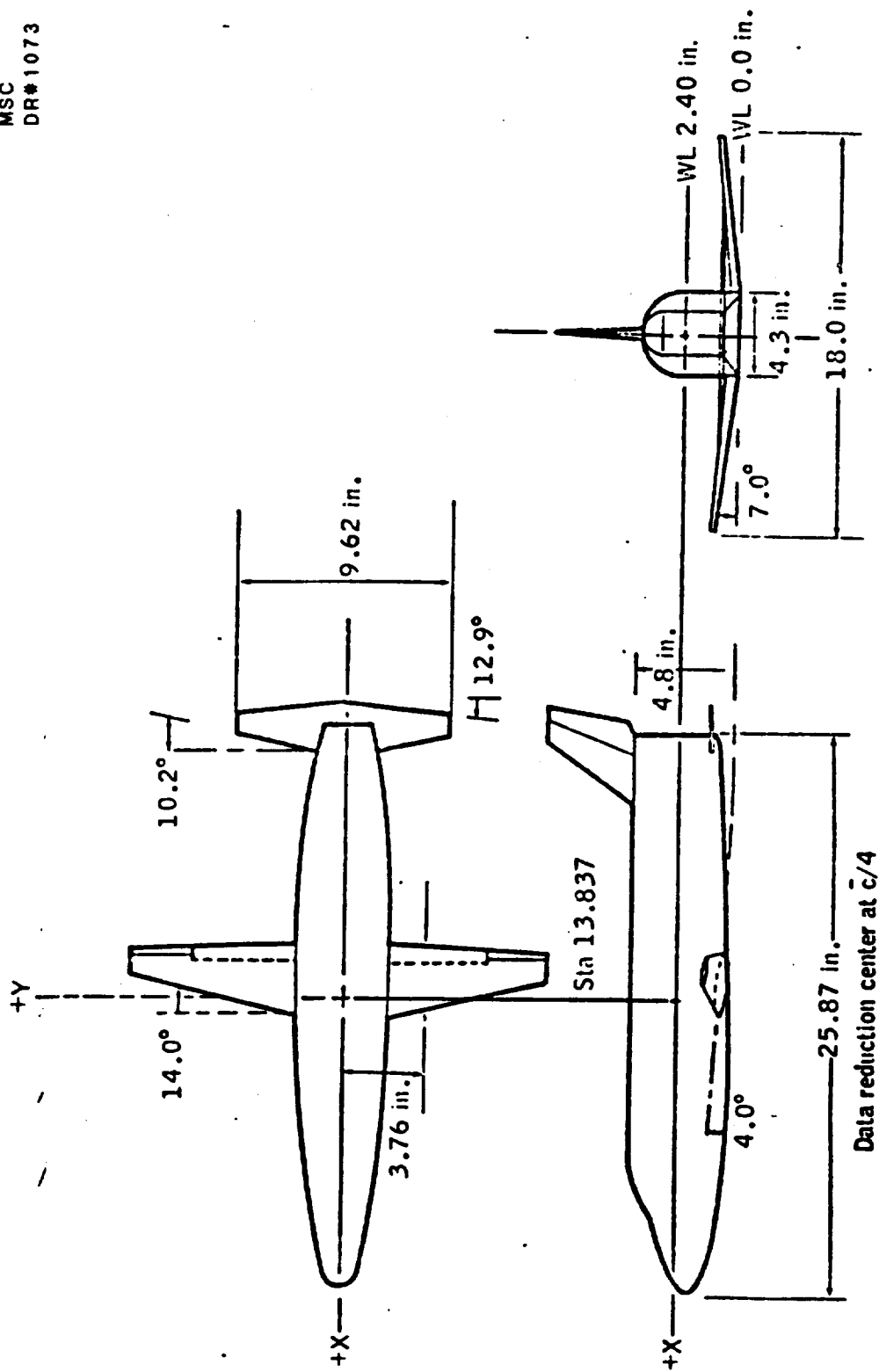
☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		WGT	1/2	1	MACH NUMBERS		
		A	B				0.25	0.5	
21	H32A	A	0	300	2	45	0.5	1	A
22	H32A			300	2	60	1	1	
23	H32A			300	2	10.2	1	1	
24	H32A			300	2	15	0	0	
25	H32A						.25		
26	H32A						.75		
27	H32A						1.00		
28	H32A			100			.5		
29	H32A			200					
30	H32A			100					
31	H32A			500					
32	H32A			300	1.0				
33	H32A			1	2.0				
34	H32A								
35	H32A			100					
36	H32A			200					
37	H32A			100					
38	H32A			500					
39	H32A			300	1.0				
40	H32A								

1	7	13	19	25	31	37	43	49	55	61	67	73	79
IDPVAR(1) IDPVAR(2) IDV													

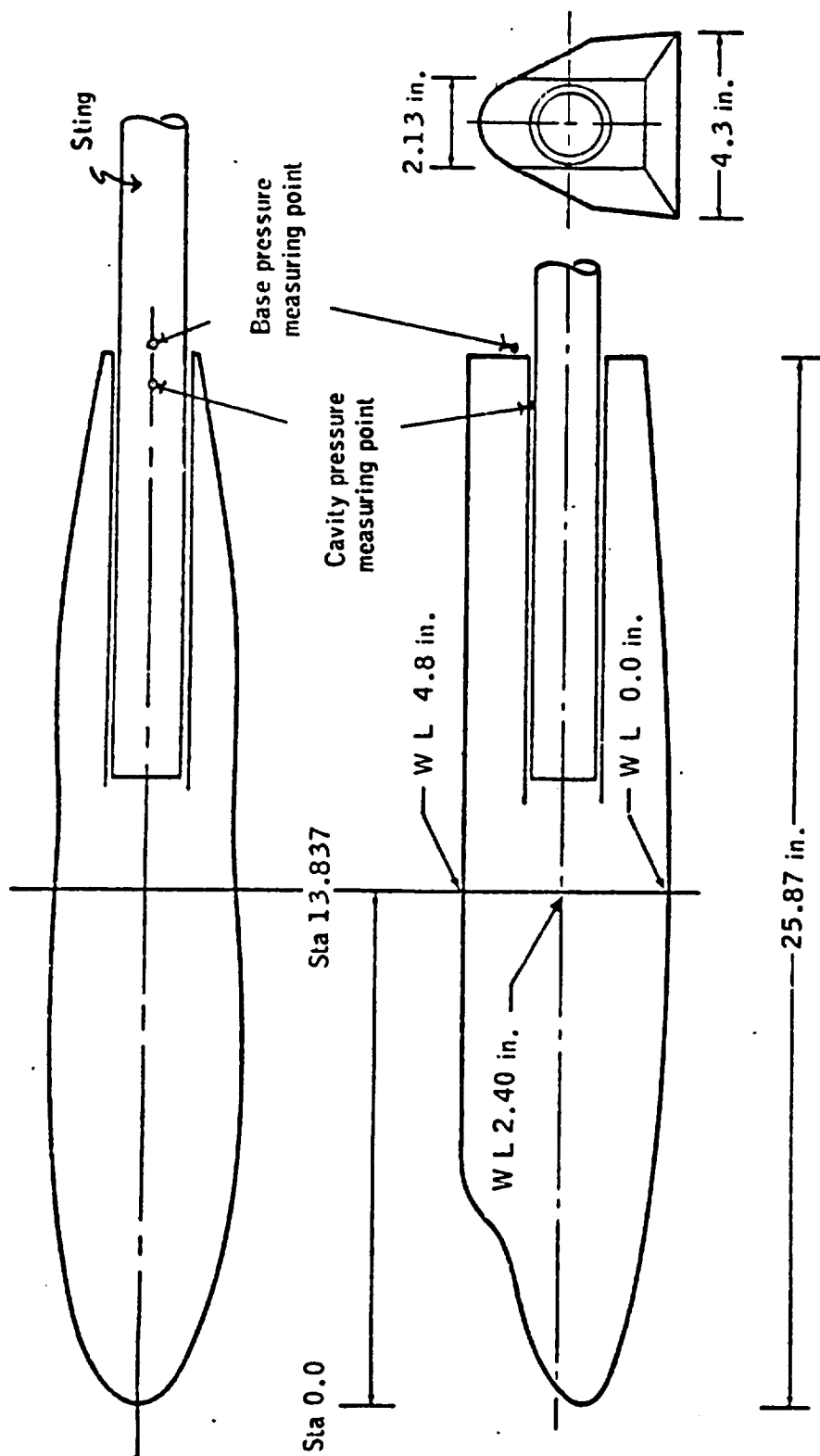
COEFFICIENTS:
A $\alpha = -1.3, 0.2, 1.6$
B $\alpha = -6.5, -1.5, -2.1, 0.1, 2.3, 4.5, 6$

ORIGINAL PAGE IS
OF POOR QUALITY



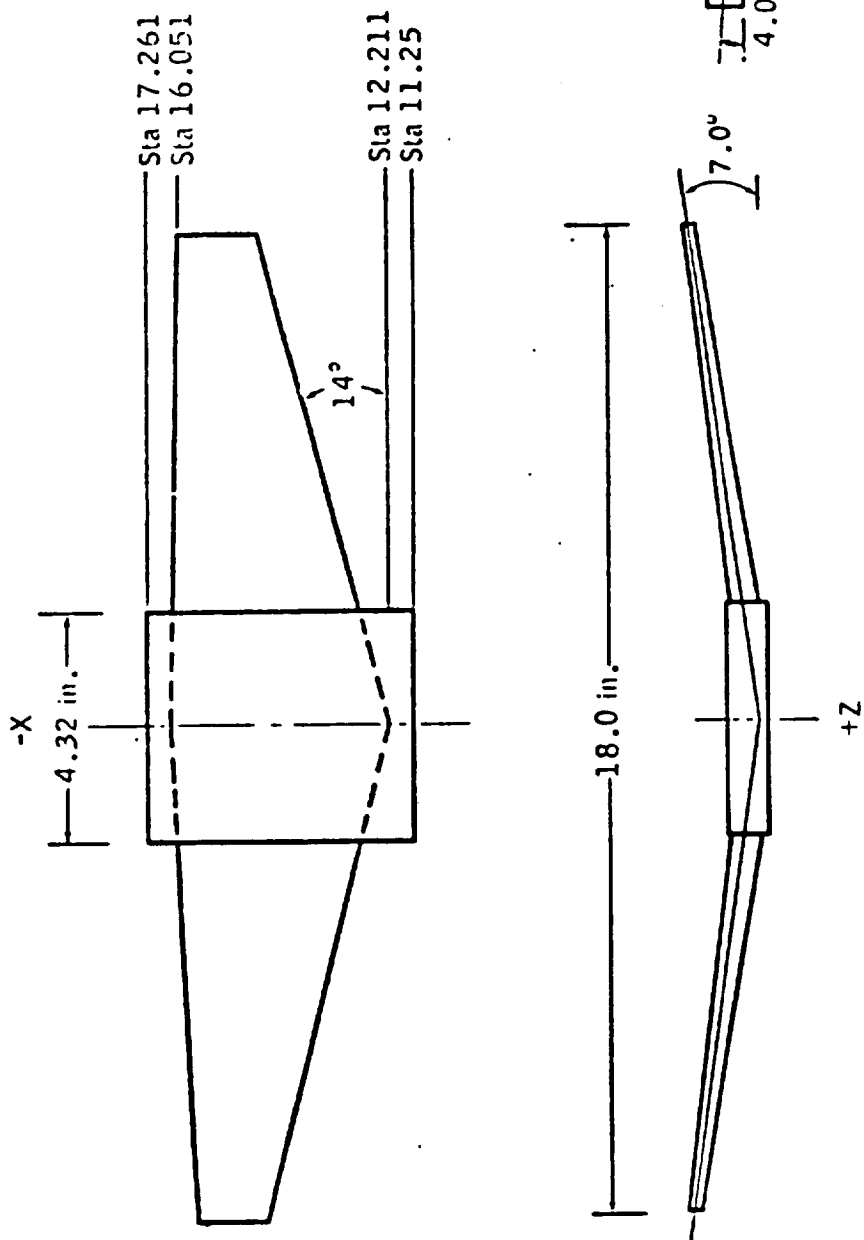
(a) Configuration $B_1 W_1 V_1 H_5$.

Figure 2.- Model S-5, 0.01875 scale model of the MSC orbiter shuttle base-line configuration.



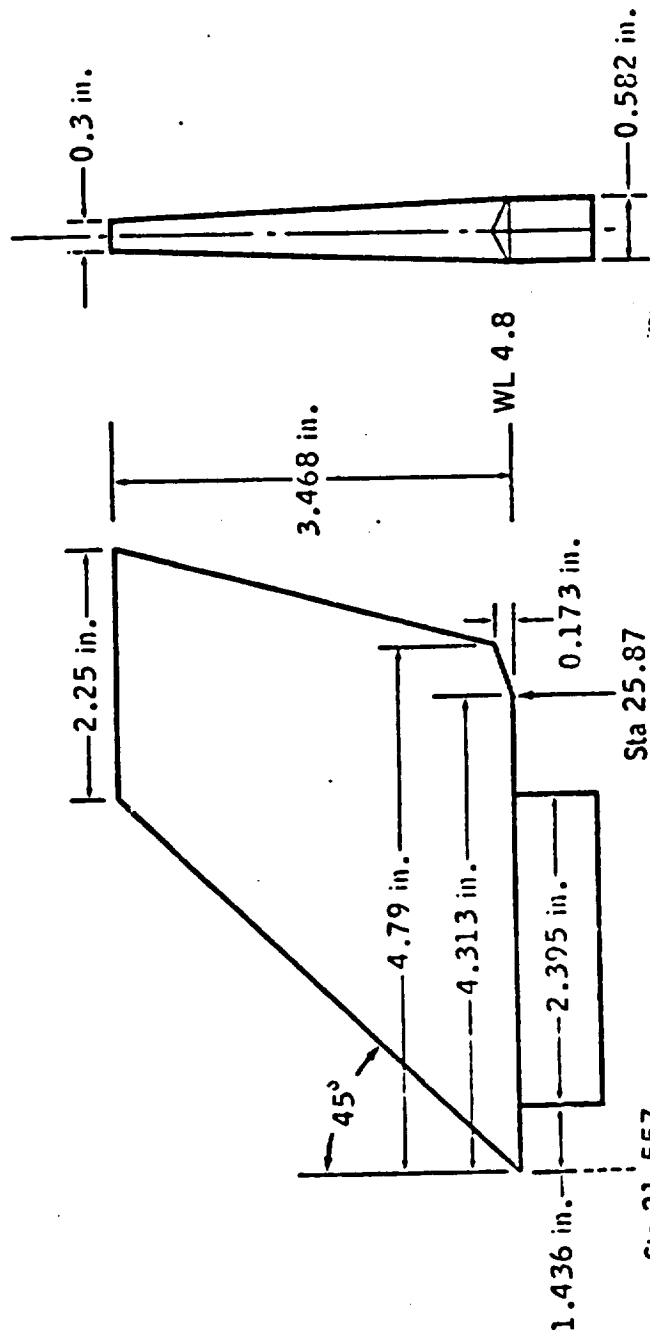
(b) Fuselage (B₁).

Figure 2.- Continued.



(c) Wing (W_1).

Figure 2.- Continued.



(d) Vertical stabilizer (V₃).

—Figure 2.— Continued.

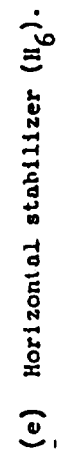
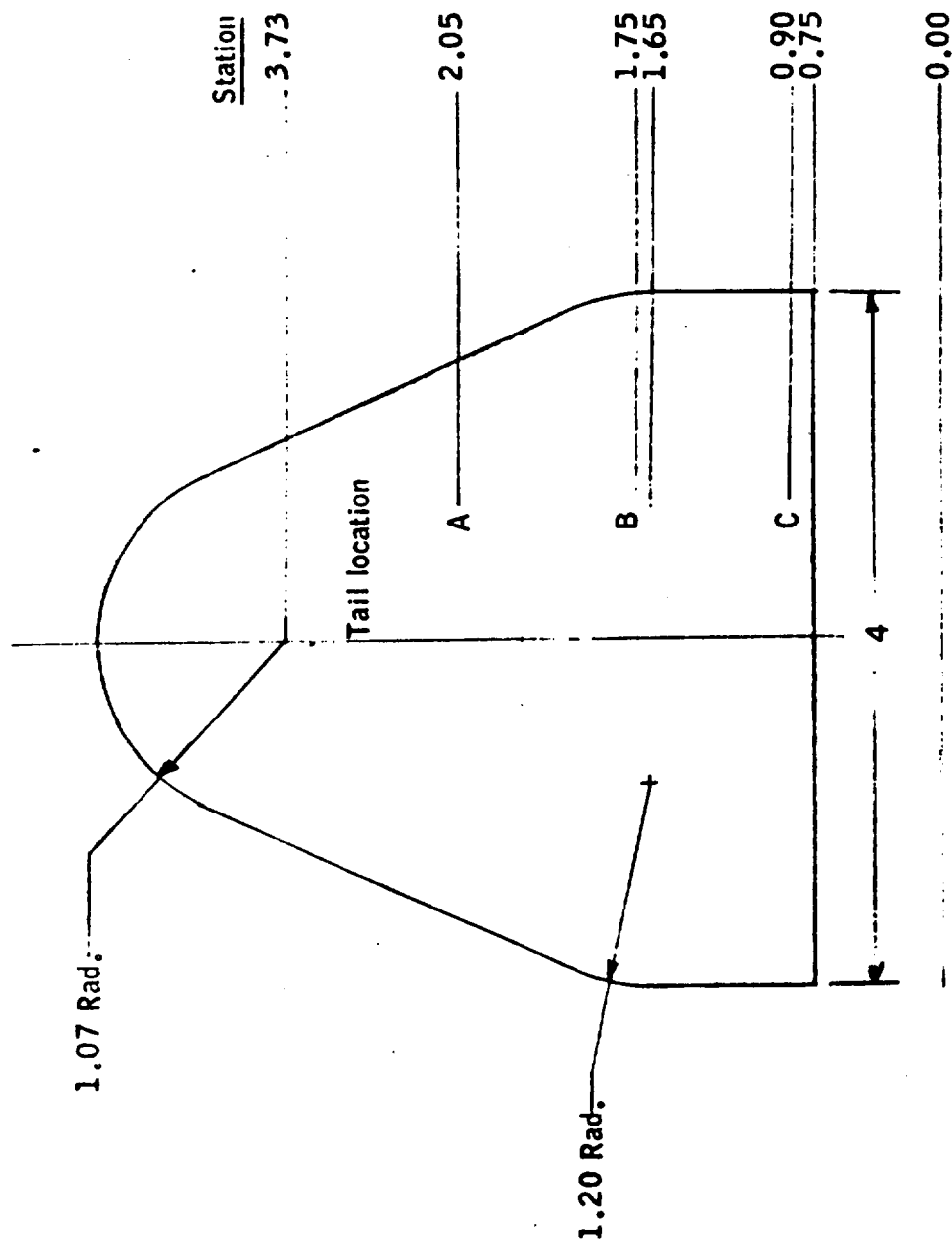


Figure 2.- Concluded.



Scale: 1/1

Figure 3.- Cross section of aft end of model showing vertical positions of the horizontal tail used during testing.

STRAIGHT WING ORBITER
MSC
DR#1073 B-1- 787

TABLE I. NASA-MSC TEST SVIII-Phase 2 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		MACH/RUN NOS.		NO. of RUNS	PARAMETERS / VALUES					
		a	B	0.25	1		δ_e	δ_r	i_x	γ/b	H.M.	
RG9001	B ₁ W ₂ H ₆ V ₃ Ss.7	A ₁ O		1 (Part A)			0	0	0	-	No	
002		O B ₁		2							Yes	
003	B ₁ W ₂ H ₆ V ₃	A ₁ O		3								
004		O B ₁		4								
005		A ₁ O		5			+5					
006				6			-5					
007				7			-15					
008				8			-25					
009				9			+15					
010				10			+25					
011				11			+30					
012		O B ₁		12			0	-20				
013				13				-15				
014				14				-5				
015				15				-10				
016	B ₁ W ₂ H ₆ V ₃ L	A ₁ O		16			45.6					
017		O B ₁		17								
018		A ₁ O		18			+5					
019		O B ₁		19								
020		A ₁ O		20			-5					

1 7 13 19 25 31 37 43 49 55 61 67 7576

CN 1 CA 1 CLM 1 CY 1 GYN 1 CBL CPBASE CHE 1 CHR 1

COEFFICIENTS: $\alpha, A_1 \rightarrow 0, -14, -10, -8, -6, -4, -2, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 20, 25, 0$

a or B

SCHEDULES $\beta, B_1 \rightarrow 0, -15, -10, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 10, 15, 0$

TABLE I. NASA--MSC TEST SVIII-Ph S: 2 DATA SET COLLATION SHEET (Continued)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		MACH/RUN NOS.		NO. of RUNS	PARAMETERS/VALUES					
		α	β				δe	δf	δr	i	h/b	H.M.
RG9021	B ₁ W ₂ H ₆ V ₃ L	0	B ₁		025	21 (Part A)	-5	45.6	-10	0	-	Yes
022		A ₁	O		22		+15					
023		O	B ₁		23							
024		A ₁	O		24				-20			
025		O	B ₁		25							
026		A ₁	O		26		-25					
027		O	B ₁		27							
028		A ₁	O		28				-10			
029		O	B ₁		29							
030		A ₁	O		30		-15					
031		O	B ₁		31							
032		A ₁	O		32				-20			
033		O	B ₁		33							
034		A ₁	O		34		0	0	0	-6		No
035	B ₁ W ₂ H ₆ V ₃				35							Yes
036					36		+5					
037					37		+15					
038					38		+25					
039					39		+30					
040					40		-5					

1 7 13 19 25 31 37 43 49 55 61 67 7576

CN 1 CA 1 CLM 1 CY 1 SYN 1 CBL 1 CPBASE CHE 1 CHR 1

COEFFICIENTS:
 α or β
 SCHEDULES

α , A₄ → 0, -14, -10, -9.5, -9.0, -8.5, -8.0,
 -7.5, -7.0, -6.5, -6.0, -4, -2, 0, 1, 2, 3, 4, 5,
 6, 7, 8, 9, 10, 12, 14, 16, 20, 25, 0

IDPVAR(1) IDPVAR(2) NDV
 STRAIGHT WING ORBITER
 MSC
 DR#1205 B-1- 789

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE I. NASA--MSC TEST SVIII - Phase 2 DATA SET COLLATION SHEET (Continued)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α B	MACH/RUN NOS.	NO. OF RUNS	PARAMETERS / VALUES									
					δe	δf	δr	i	h/b	$H.M.$				
R69 041	B ₁ W ₂ H ₆ V ₃	A ₁ O	025	41 (Part A)	-15	0	0	-6	-	Yes				
042				42	-25									
043				43	-30									
044	B ₁ W ₂ H ₆ V ₃ L			44		45.0								
045				45	-25									
046				46	-15									
047				47	-5									
048				48	0									
049				49	5									
050				50				0						
051	B ₁ W ₂ H ₆ V ₃			51	0									
052				52	-5									
053				53	-15									
054				54	-25									
055				55	-30									
056				56		0								
057				57	0			-4		No				
058		0 B ₁		58										
059		A ₅ O		1 (Part B - Sect. 1)	-2.5			0	.15	Yes				
060				2	+2.5									

1	7	13	19	25	31	37	43	49	55	61	67	7576
CN	CA	CLM	CY	CYN	CB	CPBASE	CHE	CHR				
COEFFICIENTS: α , A ₅ → 0, -12, -8, -6, -4, -2, 0, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 0												
α or β SCHEDULES												
IDFVAR(1) IDFVAR(2) NDV												

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE I. NASA--MSC TEST SVIII--Phase 2 DATA SET COLLATION SHEET (Continued)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		MACH/RUN NOS.	NO. of RUNS	PARAMETERS / VALUES					
		α	β			δe	δf	δr	δt	h/b	H.M.
RG9061	B ₁ W ₂ H ₆ V ₃	A50		3 (Part B)		-5	0	0	0	.15	Yes
062				4 (-Set:1)		+5					
063				5		-10					
064				6		-15					
065				7		-25					
066				10		0	25.0				
067				11			15.6				
068				12			15.0				
069				13			45.6				
070				15			0				
071				17					-4		
072				18					-6		
073	B ₁ W ₂ H ₆ V ₃ L	A6		19			45.6				
074				20			45.0				
075				21		-5					
076				22			45.6				
077				26		-25					
078				28		-30	45.0				
079				29			15.6				
080				30			15.0				

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN CA CCM CV CYN CBL CPBASE CHE CHR

COEFFICIENTS: α , A6 \rightarrow 0, -8, -6, -4, -2, 0, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 0

α or β

SCHEDULES

IDPVAR(1) IDPVAR(2) NDV

STRAIGHT WING ORBITER
MSC
DR#1205 B-1- 791

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCED.		MACH/RUN NOS.	NO. of RUNS	PARAMETERS/VALUES					
		A	B			Se	df	dr	LT	h/b	H.M.
R69081	B ₁ W ₂ H ₆ V ₃ L	A ₆	O	31 (Part B)		-25	15.0	0	-6	0.15	Yes
082				32 (Sect 1)		15.6					
083				33		-15					
084				34		15.0					
085				35		-5					
086				36		15.6					
087				37		0					
088				38		15.0					
089				44		-15			0		
090				45		15.6					
091				53		-25	45.6				
092				54		-15					
093				55		45.0					
094				56		-5					
095				57		45.6					
096				58		0					
097				59		45.0					
098	B ₁ W ₂ H ₆ V ₃	A ₅		60							
099				61		25.6					
100				63		-30	0				

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CN 1 CA 1 CLM 1 CY 1 CYN 1 CBL 1 GPBASE CHE 1 CHR 1

COEFFICIENTS:

a or B

SCHEDULES

IDPVAR(1)

IDPVAR(2)

IDV

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE I. NASA--MSC TEST SVIII--Phase 2 DATA SET COLLATION SHEET (Continued)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCALING α β	MACH/RUN NOS.	NO. of RUNS	PARAMETERS/VALUES					
					δe	δf	δr	δt	δy	H.M.
RG9101	B ₁ W ₂ H ₆ V ₃	A ₅ 0	0.25		0	0	0	-2	.15	Yes
102	B ₁ W ₂ H ₆ V ₃ L	A ₆	64 (Part B)		-15	45.6		-6		
103			65 (Set 1)		45.0					
104			66		-25					
105			67		-30	45.6				
106	B ₁ W ₂ V ₃	A ₅	68							
107			69							
108			70			45.0				
109			71			15.0				
110			72			15.6				
111	B ₁ V ₃		73			0				
112	B ₁ W ₂ V ₃ H ₆ L	A ₆	74							
113			75		-30	15.0		0		
114			76		15.6					
115			80		-25					
116			81		15.0					
117			82		-5					
118			83		15.6					
119			84		0					
120			85		15.0					
			86		-30	45.0				
					37	43	49	55	61	67
CN					75	76				
COEFFICIENTS:					IDPVAR(1) IDPVAR(2) NDV					
α or β										
SCHEDULES										

STRAIGHT WING ORBITER
MSC
DR#1205 B-1- 793

TABLE I. NASA--MSC TEST SVIII--Ph--Se -

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCID.		MACH/RUN NOS.	NO. of RUNS	PARAMETERS / VALUES				
		a	b			Se	6f	6r	Lx	h/b H.M.
RG121	B ₁ W ₂ H ₆ V ₃ L	A ₄ 0		0.25	87 (Part B)	-30	45.6	0	0	.15 Yes
122		↓			88 - Sect. 1	-25	45.0			↓
123		A5			1 (Part B)	↓	↓			.20
124					2 - Sect. 2	↓	45.6			
125					3	-30	↓			
126					4	↓	45.0			
127					5	-15	↓			
128					6	↓	45.6			
129					7	-5	↓			
130					8	↓	45.0			
131					9	0	↓			
132					10	↓	45.6			
133					11	↓	15.6			
134					12	↓	15.0			
135					13	-5	↓			
136					14	↓	15.6			
137					15	-15	↓			
138					16	↓	15.0			
139					17	-25	↓			
140		↓	↓		18	↓	15.6	↓	↓	↓

1 7 13 19 25 31 37 43 49 55 61 67 7576

CN 1 CA 1 CLM 1 CY 1 CYN 1 CBL CPBASE CHE 1 CAR 1

COEFFICIENTS: IDPVAR(1) IDPVAR(2) NDV

a or b

SCHEDULES

TABLE I. NASA--MSC TEST SVIII-Phase 2 DATA SET COLLATION SHEET (Continued)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCUD.		MACH/RUN NO.	NO. OF RUNS	PARAMETERS / VALUES				
		α	β			δe	$\delta + \delta r$	$L + \frac{1}{2} b$	$H.M.$	
RG9141	B.W2H6V3L	A5	0	025	19 (Part B)	-30	15.6	0	.20	Yes
142					20 (Set 1.2)		15.0			
143		A2			1 (Part B)					
144					2 (Set 1.3)		15.6		.30	
145					3	-25				
146					4		15.0			
147					5	-15				
148					6		15.6			
149					7	-5				
150					8		15.0			
151					9	0				
152					10		15.6			
153					11		45.6			
154					12		45.0			
155					13	-5				
156					14		45.6			
157					15	-15				
158					16		45.0			
159					17	-25				
160					18		45.6			

7 13 19 25 31 37 43 49 55 61 67 75.76

CA CLM CY CYN CBL CPBASE CHE CHR

COEFFICIENTS:
 α or β
 SCHEDULES

$\alpha, A2 \rightarrow 0, -12, -8, -6, -4, -2, 0, 2, 4, 5$
 $6, 7, 8, 9, 10, 11, 12, 14, 16, 0$

IDPVAR(1) IDPVAR(2) NDV

STRAIGHT WING ORBITER
 MSC
 DR#1205 B-1- 795

TABLE I. NASA..MSC TEST SVIII -Phase 2 DATA SET COLLATION SHEET (Concluded)

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		MACH/RUN NOS.		NO. OF RUNS	PARAMETERS / VALUES				
		A	B	1	2		δe	δf	δr	Δt	1/δ H.M.
RG9 161	B ₁ W ₂ V ₃ H ₆ L	A ₂	0			19 (Part B)	-30	45.6	0	0	.30 Yes
162	↓	↓	↓			20 - Set 3	↓	45.0			↓
163	B ₁ W ₂ H ₆ V ₃ S ₁₁ 15	A ₁₀	-5			41 (Part C)	0	0			No
164	(I)					42					
165	↓	-1				43					
166		0				44					
167	↓	1				45					
168	B ₁ W ₂ H ₆ V ₃ S ₁₀ 18	5				46					
169	(I)					47					
170		0				48					
171	↓	-1				49					
172	↓	-5				50					
173	B ₁ W ₂ H ₆ V ₃ T (I)	A ₉	0			51					
174	B ₁ H ₆ V ₃ T (I)					52					
175	B ₁ W ₂ H ₆ T (I)					53					
176	B ₁ W ₂ T (I)					54					
177	B ₁ W ₂ H ₆ V ₃ T	A ₈				55					Yes
178	B ₁ W ₂ H ₆ V ₃ R ₁ T					57					
179	B ₁ W ₂ H ₆ V ₃ R ₁					58					
180	B ₁ W ₂ H ₆ V ₃					59					

1	7	13	19	25	31	37	43	49	55	61	67	75.76
CN CA CLM CY CYN CBL CPBASE CHE CHR												
COEFFICIENTS:												
α or β												
SCHEDULES												
NOTE: (I) Indicates model inverted												

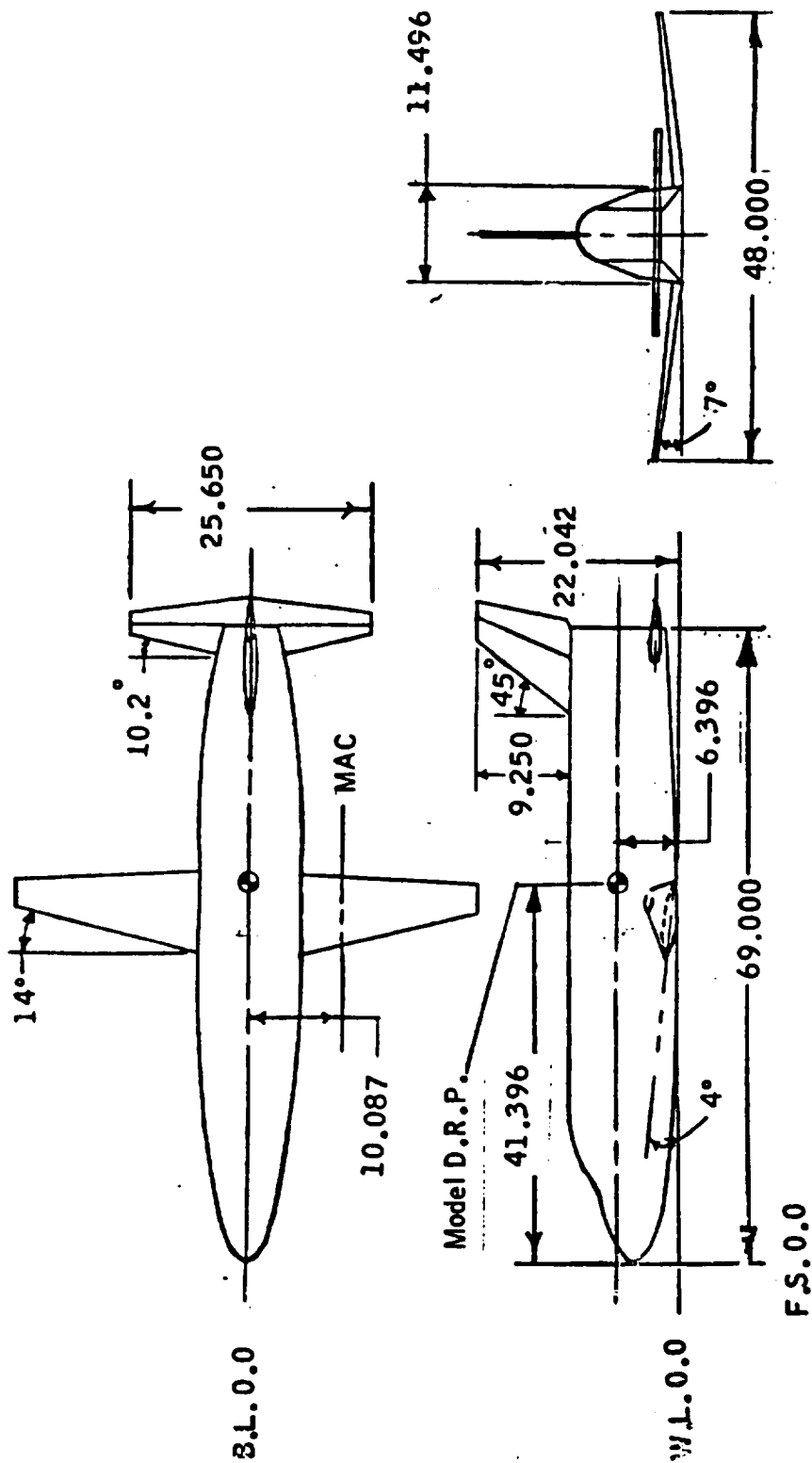


Figure 2. - Model geometry. Configuration B₁W₂H₆V₃ (all dimensions in inches)

STRAIGHT WING ORBITER
MSC
DR#1205 B-1- 797

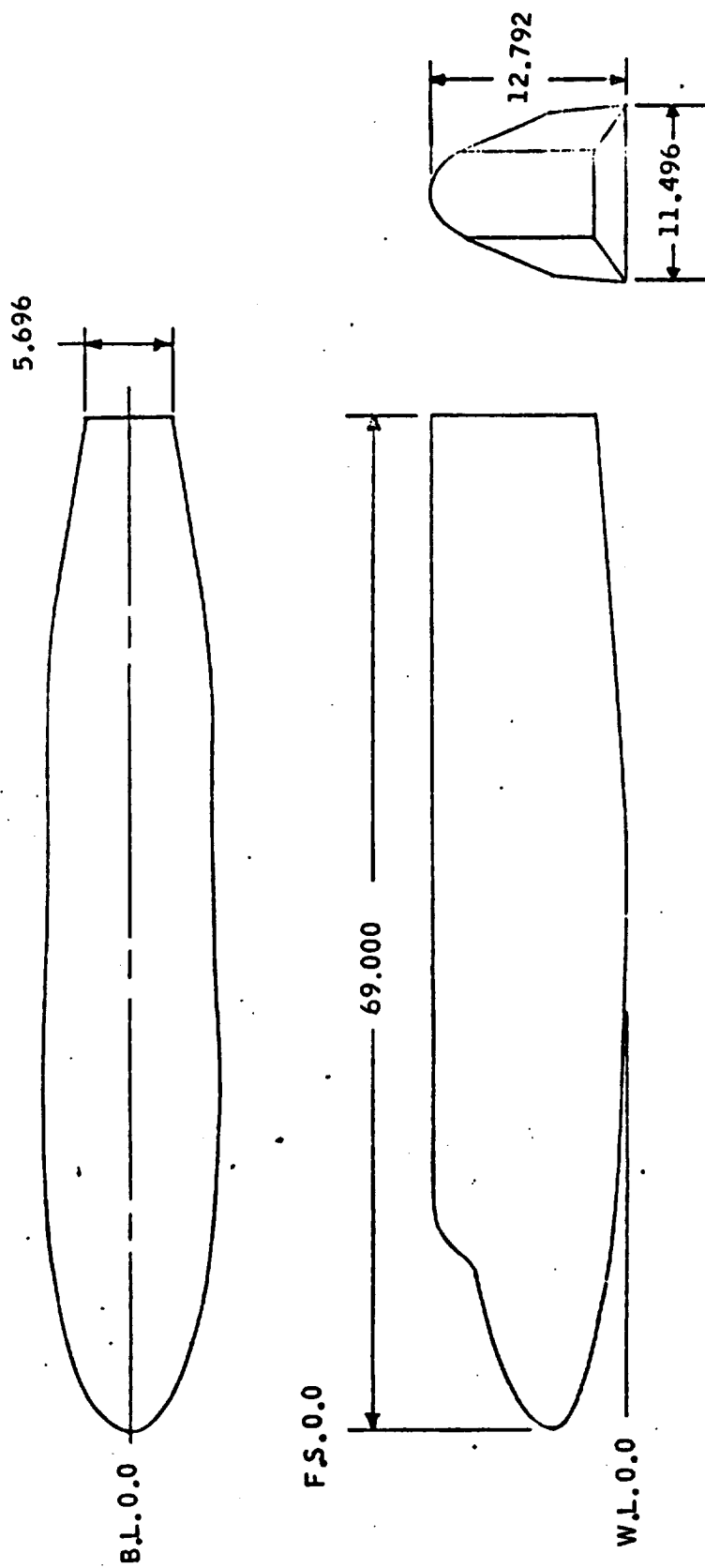


Figure 3. - Fuselage B₁ (all dimensions in inches)

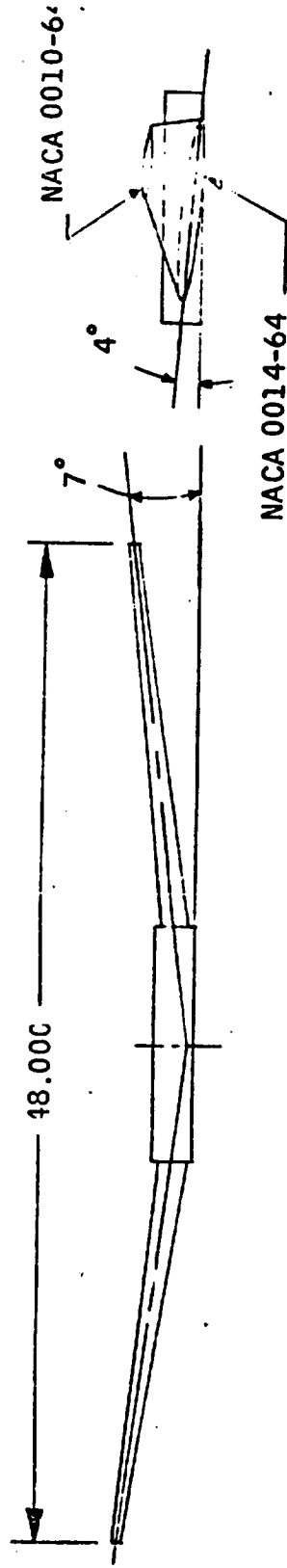
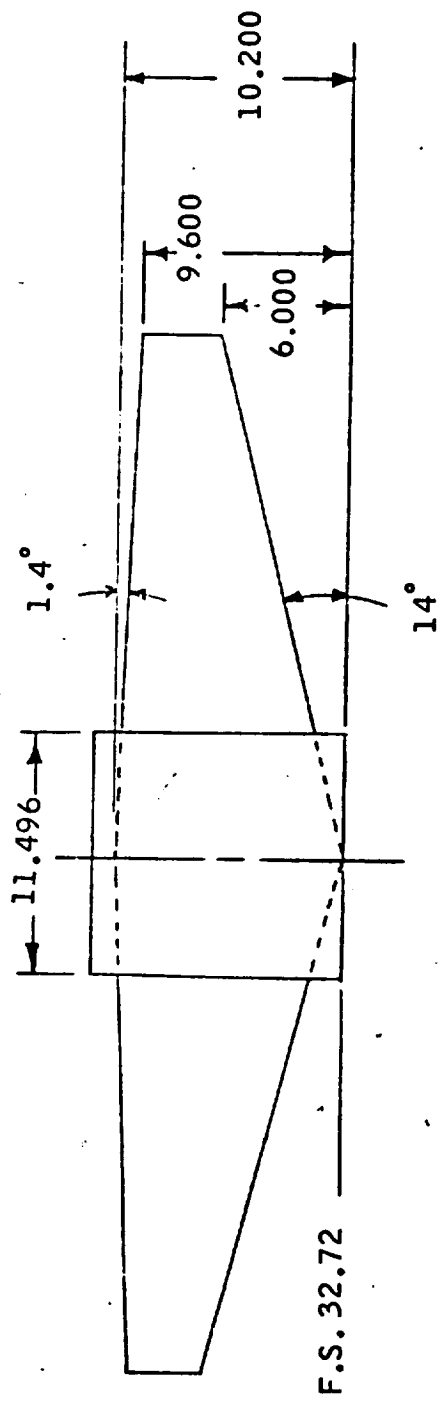


Figure 4. - Wing W₂ (all dimensions in inches)

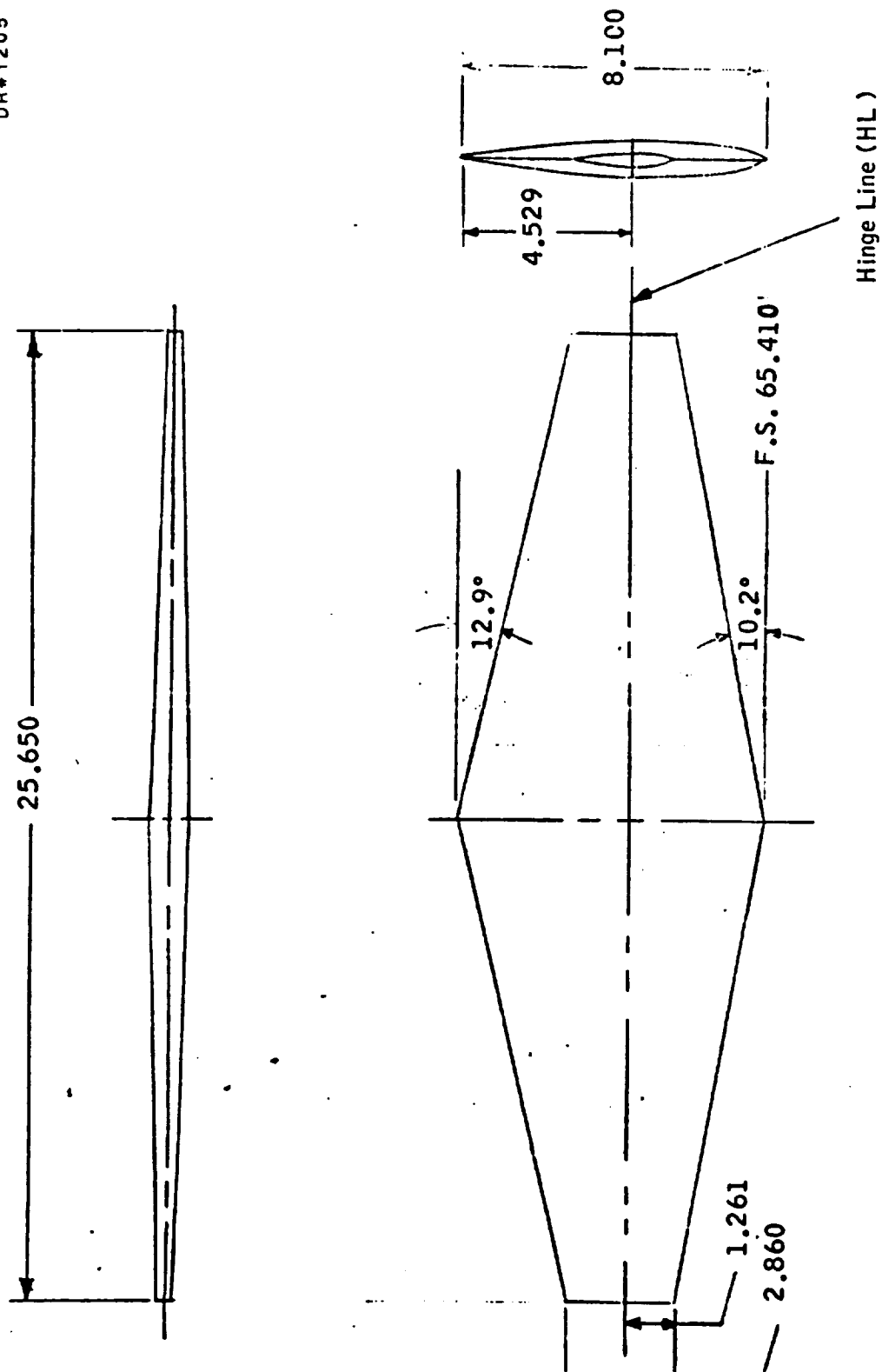


Figure 5. - Horizontal tail H₆ (all dimensions in inches)

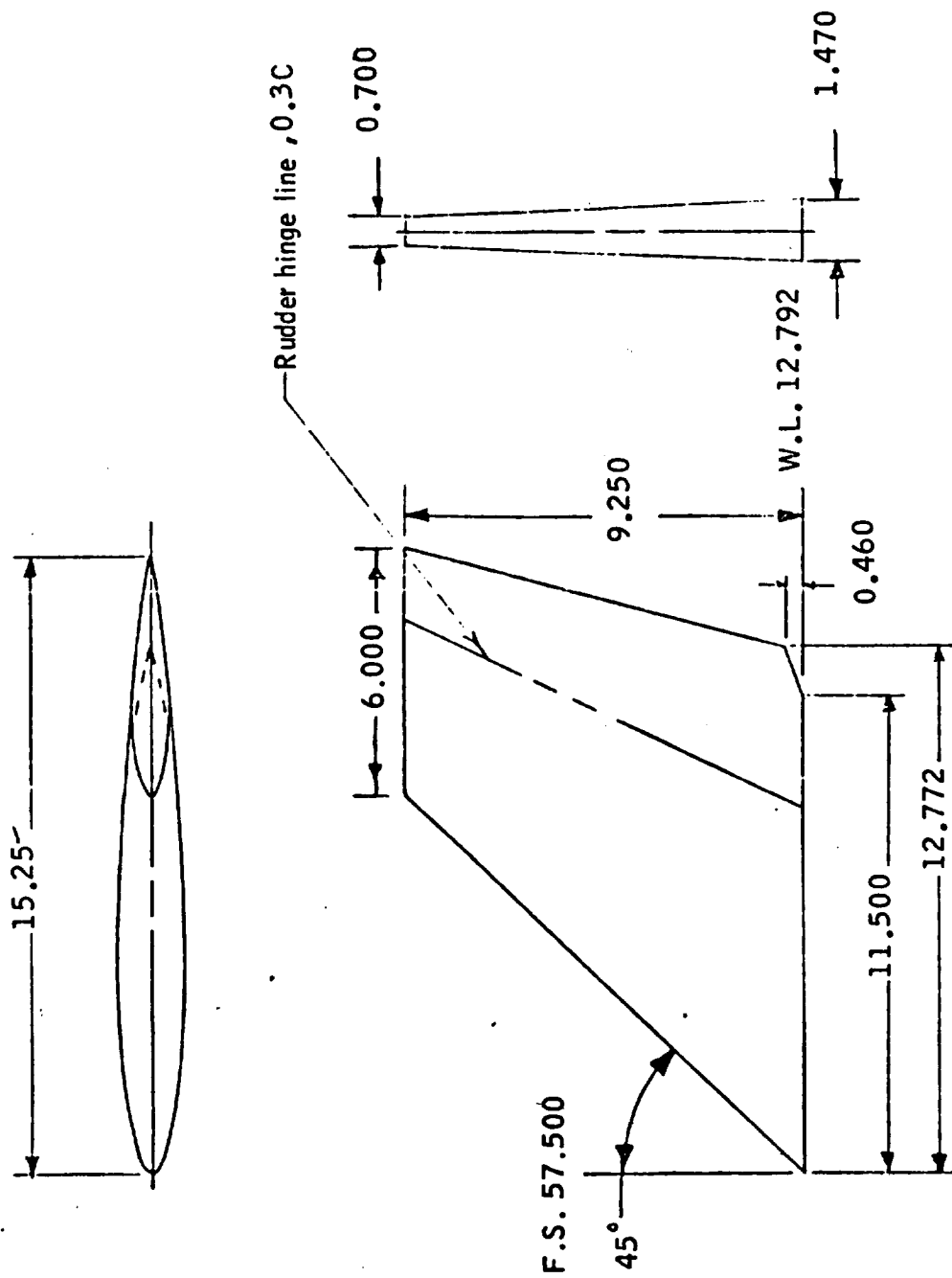
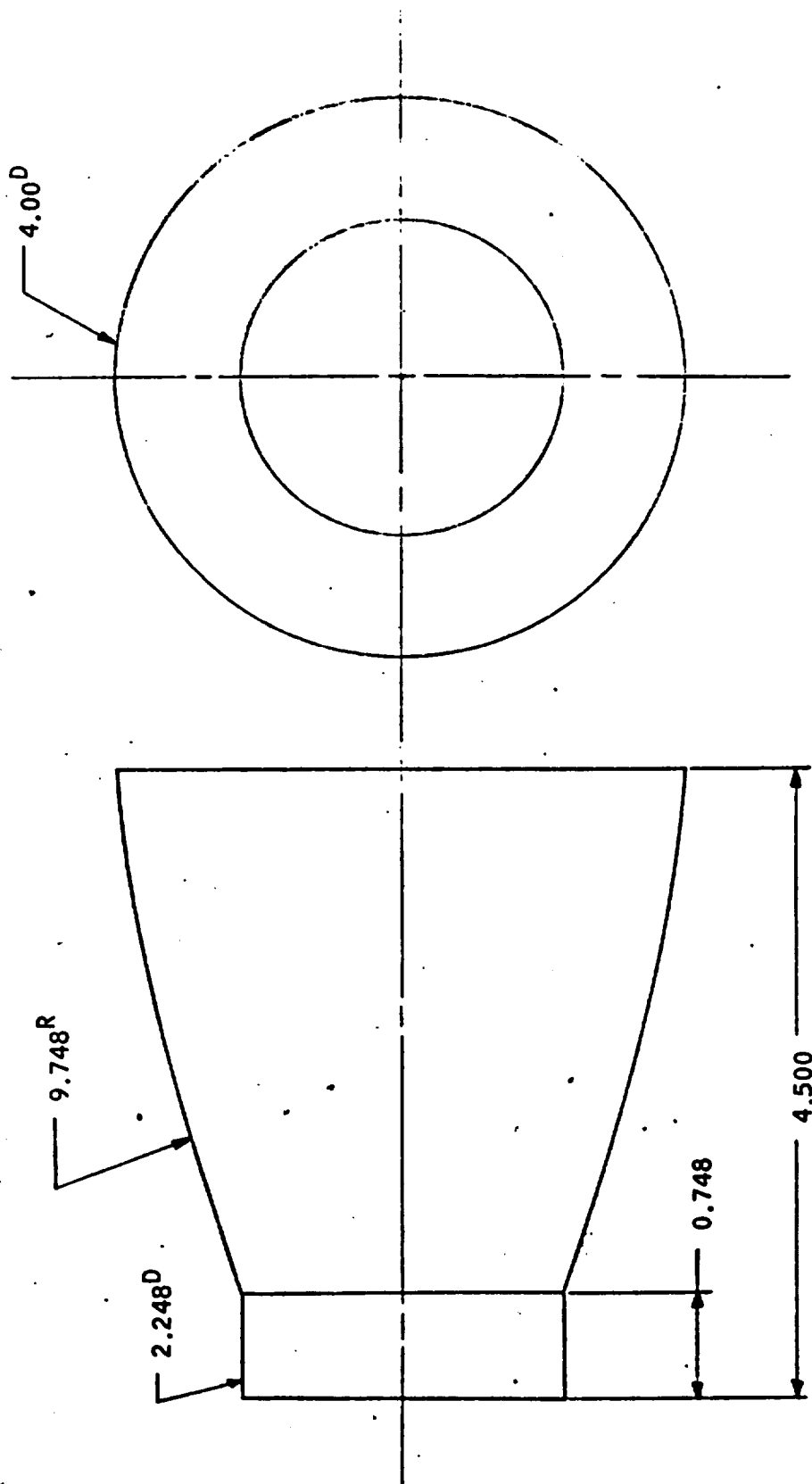


Figure 6. - Vertical Tail V3 (all dimensions in inches)

STRAIGHT WING ORBITER
MSC
DR#1205 B-1- 802



M.S. 69.0

	Lower Rocket Nozzle (centerline position)	Upper Rocket Nozzle (centerline position)
B.L.	0.0	0.0
W.L.	6.252	11.0

Figure 7. - Model Rocket Engine Nozzle R₁ (all dimensions in inches)

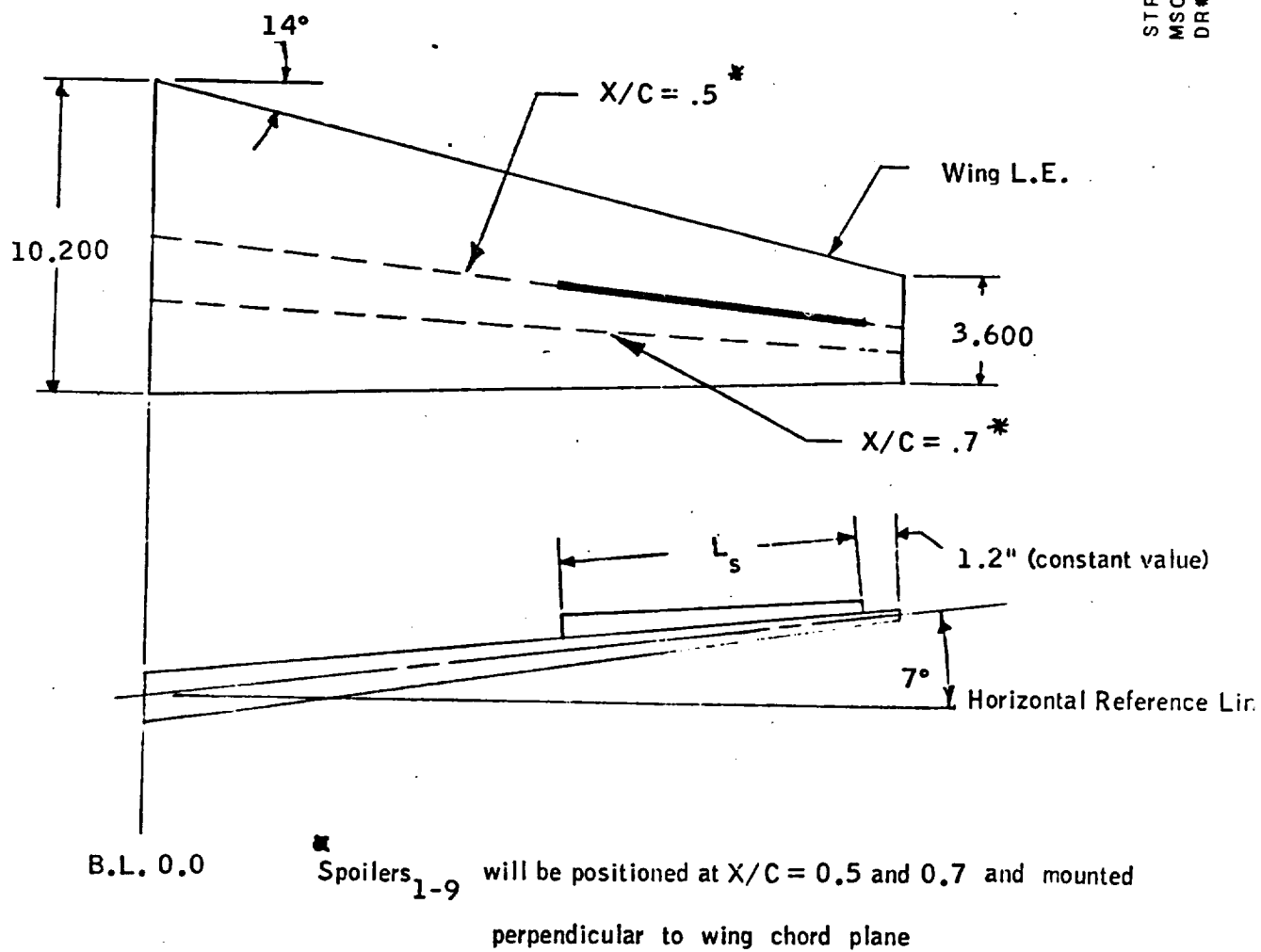


Figure 8. - Spoiler configuration. (all dimensions in inches)

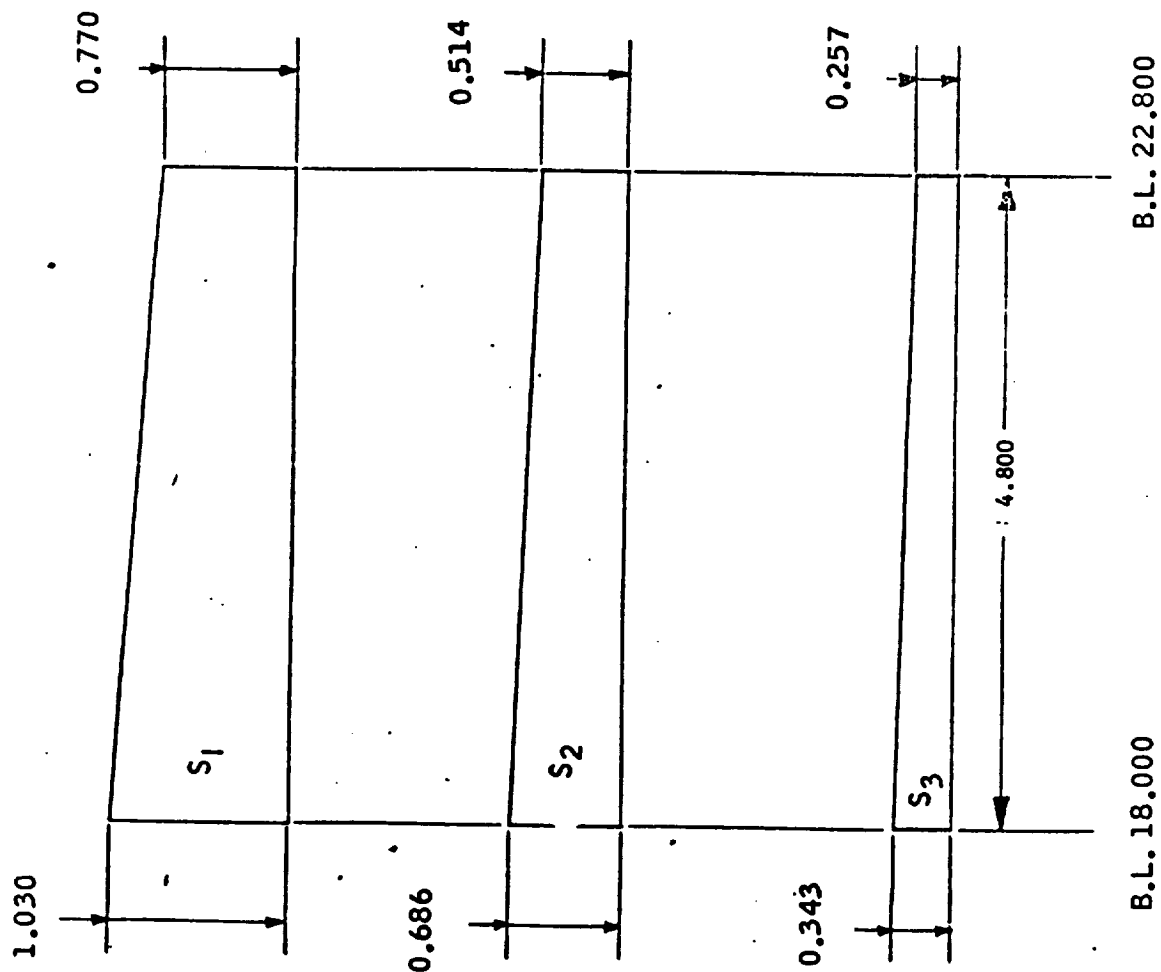
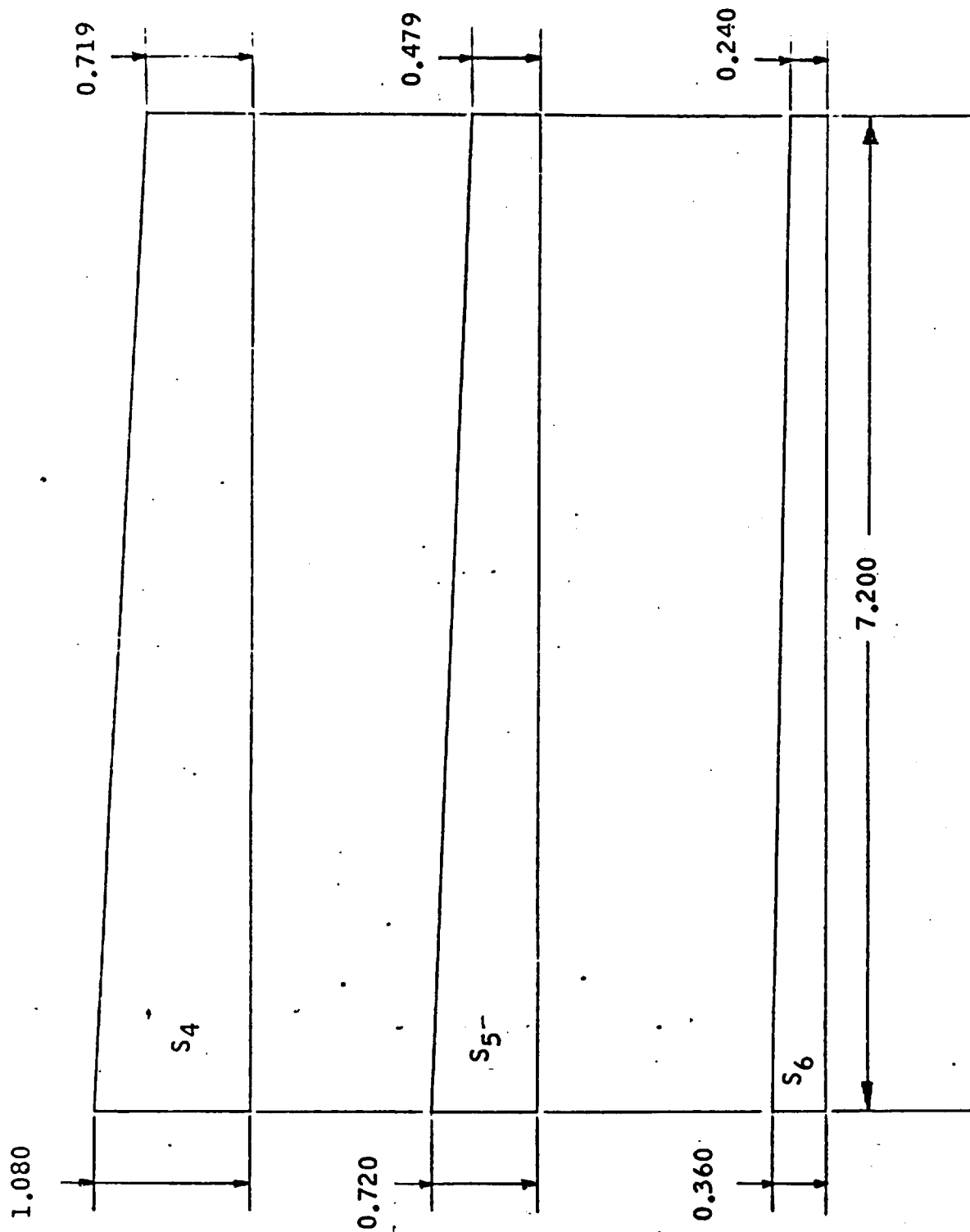


Figure 9. - Model Spoilers (all dimensions in inches)



B.L. 15.600

B.L. 22.800

STRAIGHT WING ORBITER
MSC
DR#1205 B-1- 805

Figure 9. - Continued.

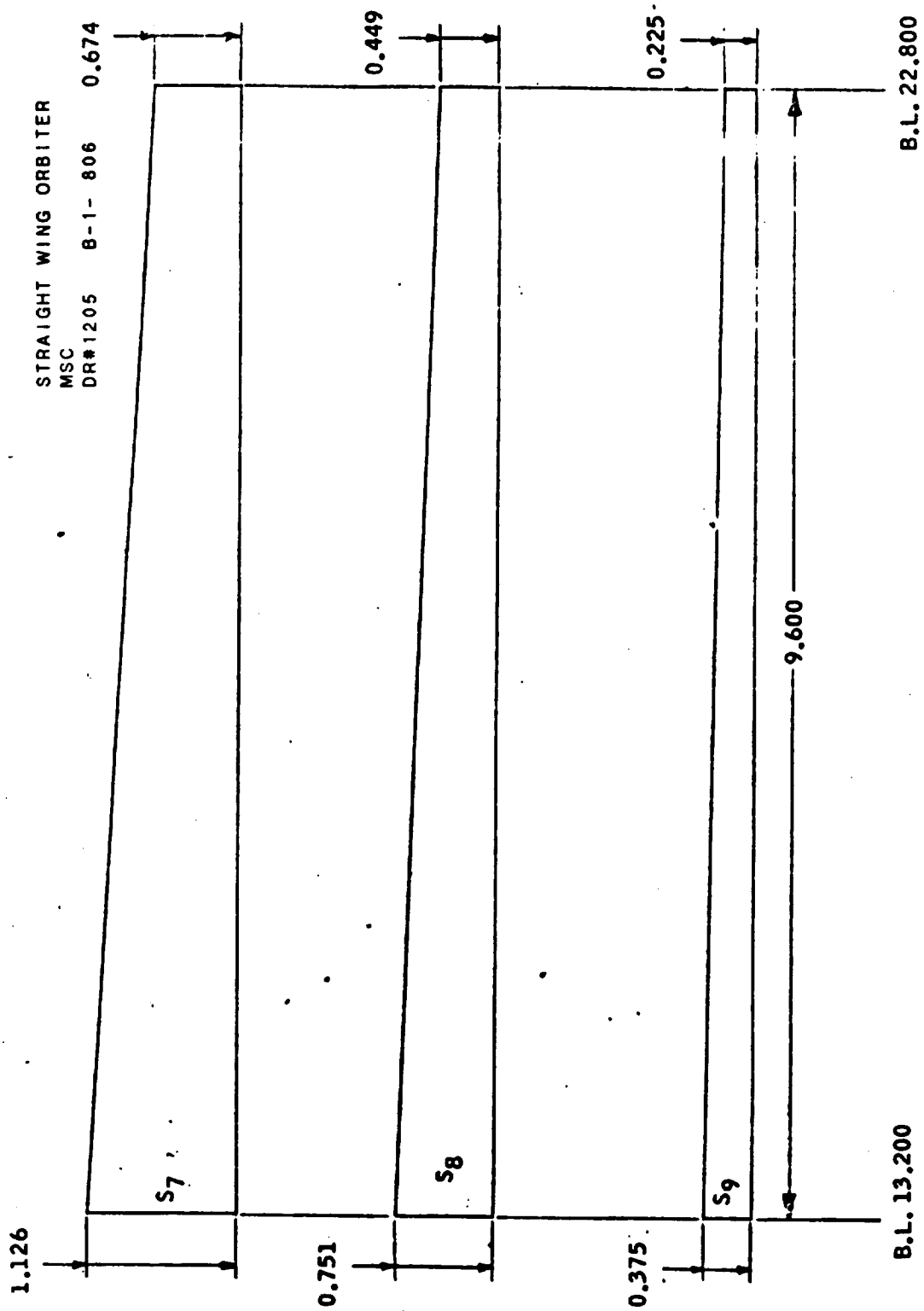
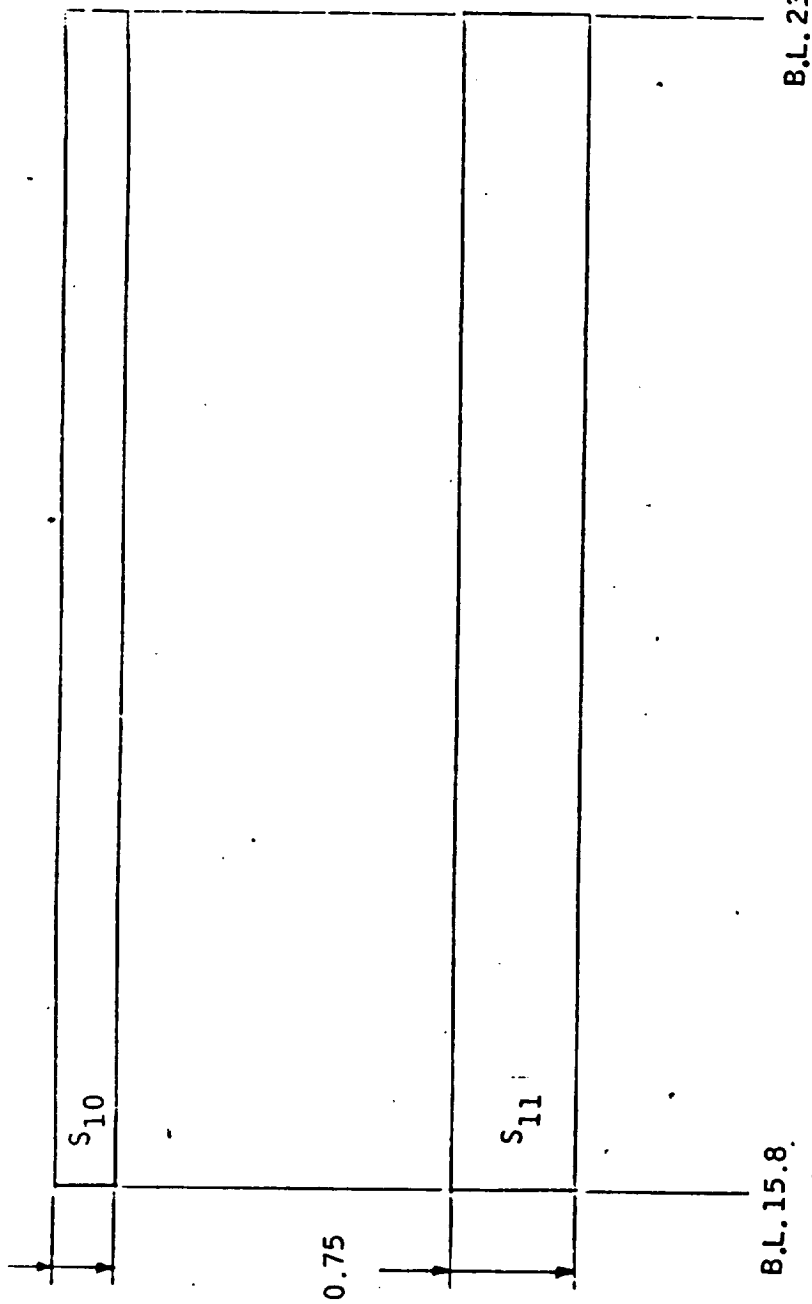


Figure 9. - Continued.

0.37



* The outboard edge of Spoilers₁₀₋₁₁ is located a constant 1.00 inches inboard of the wing tip while each is mounted perpendicular to the wing chord plane at $x/c = 0.15$

STRAIGHT WING ORBITER
MSC
DR#1205 B-1- 807

Figure 9. - Concluded.

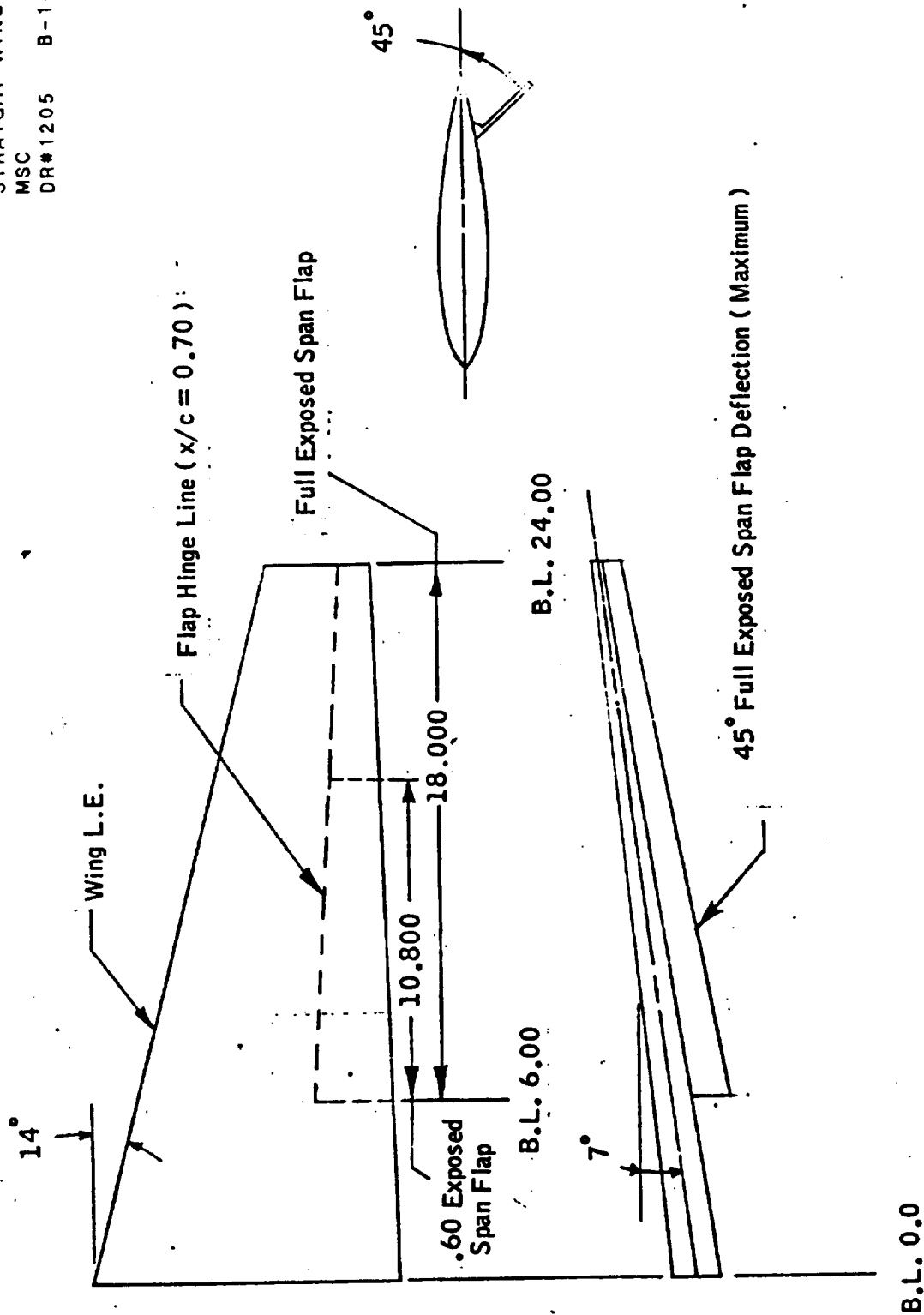


Figure 10. - Flap configuration. (all dimensions in inches)

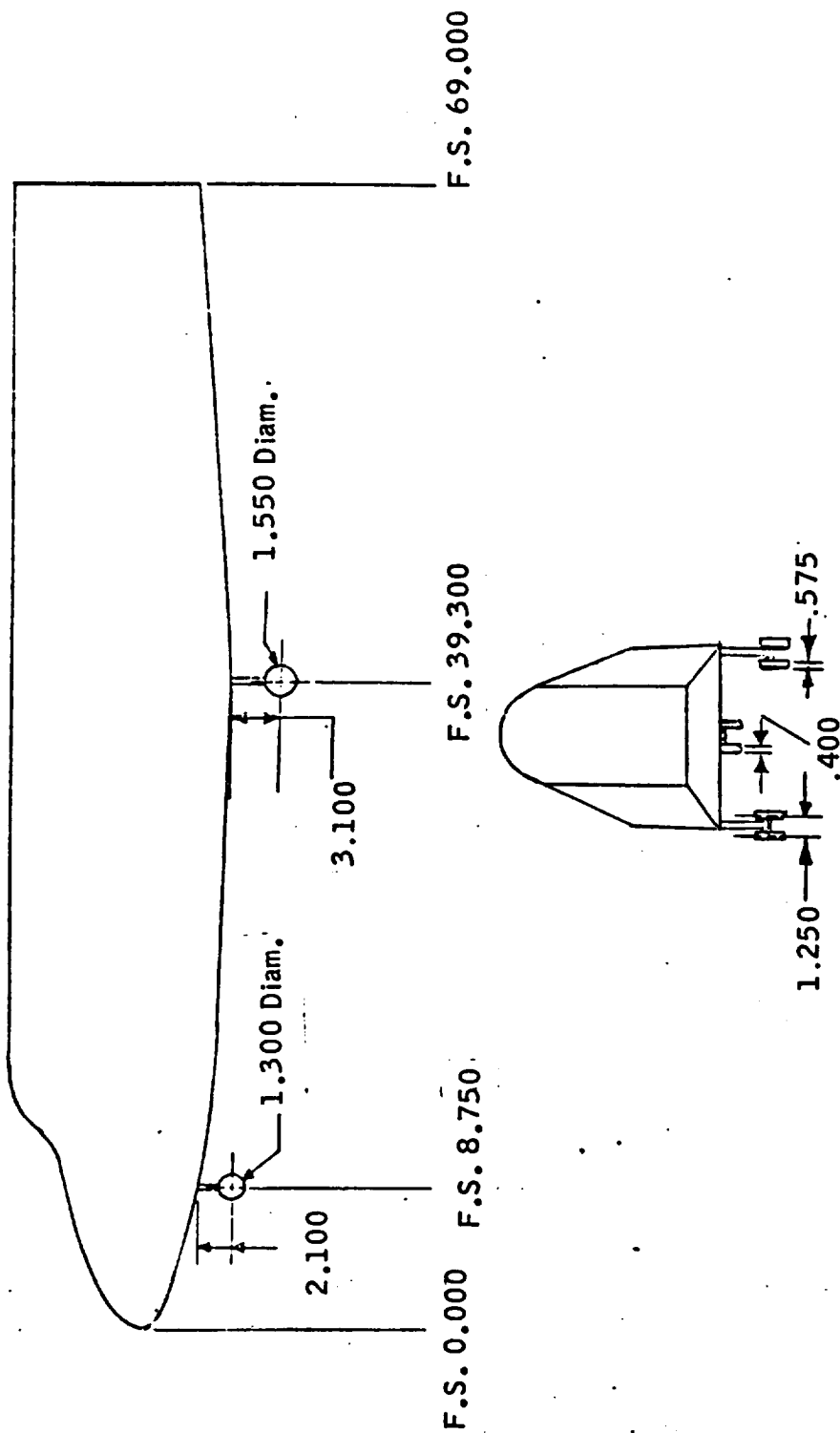


Figure 11. - Landing gear configuration. (all dimensions in inches)

STRAIGHT WING ORBITER
MSC
DR#1205 B-1- 809

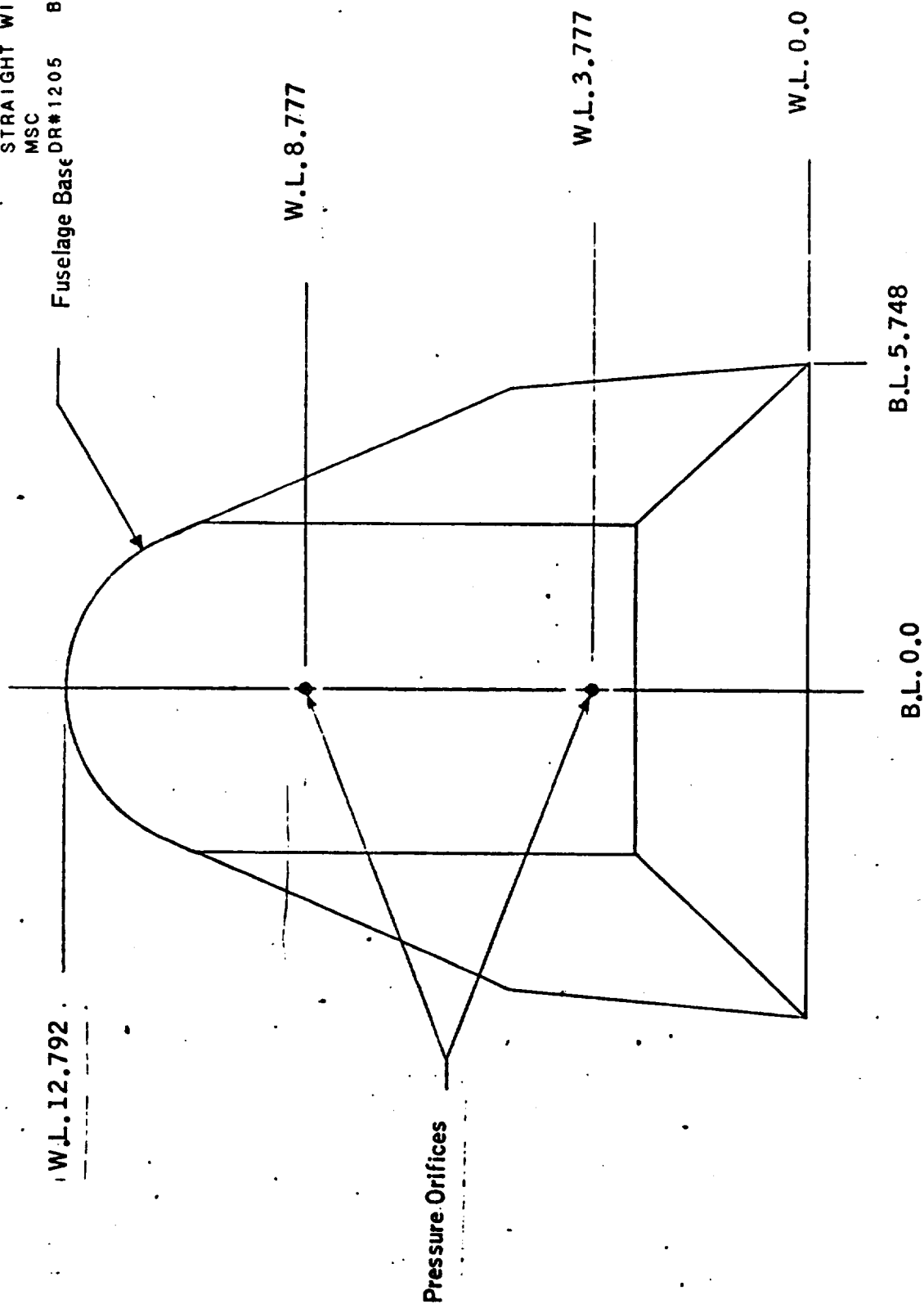


Figure 12. - Model Pressure Orifices (all dimensions in inches)

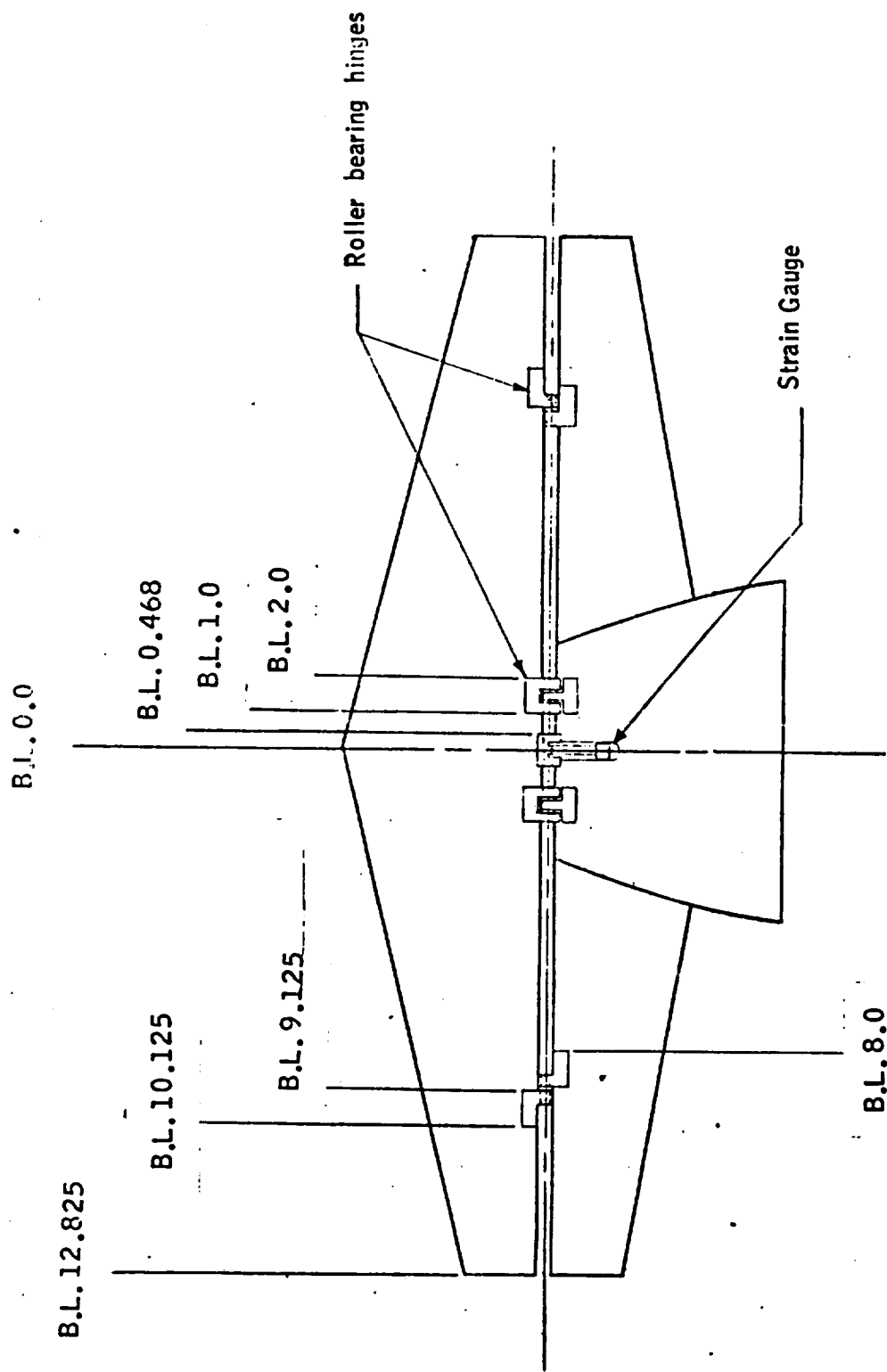



Figure 13. - Hinge Moment Instrumentation (all dimensions in inches)

STRAIGHT WING ORBITER
MSC
DR#1205 B-1-811

TEST NAAL-629 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER		CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS												POST TEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
			α	β	1	2	3	4		5	6	7	8	9	10	11	12	13	14	15	16		17	18	19	20	21	22	23	24	25																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
RC4001	B6		A	0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					

COEFFICIENTS:

- A) $-4 \frac{A^2}{2} \rightarrow 20; 20 \frac{A^2}{2} \rightarrow 70$
 B) $-8 \frac{A^2}{2} \rightarrow 2; 2 \frac{A^2}{2} \rightarrow 4$
 C) $-15 \frac{A^2}{2} \rightarrow 5; 10, 15, 20, 25, 30$

α or β
SCHEDULES

CL CDE ICNM CN CAF08ICNM CSL CY ICNM/ANLID

NDV

SHEET 1 of 6

TEST NAAL 629 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

ORIGINAL PAGE IS
 OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. OF RUNS	MACH NUMBERS									
		α	β	δ_{HL}	δ_{NA}	δ_{MA}		.26									
RC4035	B6W6H12	A	0	0	0												
059		0	B					35									
060		10	B					59									
061		20	B					60									
062		60	B					61									
009	B6W6H13	A	0					62									
079		A	0					9									
012		0	B					79									
080		10	B					12									
011		20	B					80									
010		60	B					11									
028	B6W8H12	A	0					10									
029	B6W8H13	A	0					28									
027	B6W9H12	A	0					29									
120	B6W9H12	C	0					27									
026	B6W9H13	A	0					120									
081	B6H13V5	A	0					26									
082		A	0	0	0			81									
		A	0	10	10			82									
RC4083		A	0	-10	-10			83									

1	7	13	19	25	31	37	43	49	55	61
---	---	----	----	----	----	----	----	----	----	----

COEFFICIENTS:

α or β _____
 SCHEDULES _____
 STRAIGHT WING ORBITER
 NR _____
 DR#1010 B-1- 813

TEST NAAL 629 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		α	β	δ_{uL}	δ_{uR}		.26	13	16	15	14	65	66	67	68	69
RC4013	B6W6 H13 V5	A	0	0	0											
016		0	B													
015		20														
014		60														
065		A	0	-50	-50											
066		0	B													
067		10														
068		20														
069		60														
070		A	0	-40	-40											
071				-30	-30											
072				-20	-20											
074				-10	-10											
076				10	10											
077				20	20											
078				30	30											
073				20	-20											
075				10	-10											
053	B6W6 H12 V5	A	0	20	-20											
RC4055	B6W6 H12 V5	A	0	10	-10											

COEFFICIENTS:

α or β
SCHEDULES

NDV

SHEET 3 of 6

NAAL 629

ORIGINAL PAGE IS
OF POOR QUALITY

PRETEST

[illegible]

COEFFICIENTS:

a or b SCHEDULES

STRAIGHT WING ORBITER
NR
DR#1010 B-1- 815

SHEET 4

218

TEST NAAL 629 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION		NO. of RUNS	MACH NUMBERS									
		α	β	δ_{HL}	δ_{HS}											
RC4088	B7	A	0	-	-											
089	||	0	B	-	-		88									
090	||	10		-	-		89									
091	||	20		-	-		90									
092	||	60		-	-		91									
093	B7W9	A	0	-	-		92									
094	||	0	B	-	-		93									
095	||	10		-	-		94									
096	||	20		-	-		95									
097	||	60		-	-		96									
098	B7W9H12	A	0	0	0		97									
099	||	0	B	|	|		98									
100	||	10		|	|		99									
101	||	20		|	|		100									
102	||	60		|	|		101									
113	B7W9H13	A	0				102									
114	||	0	B				113									
115	||	10					114									
116	||	20					115									
RC4117	||	60					116									
							117									

COEFFICIENTS: 1 7 13 19 25 31 37 43 49 55 61

α OF β SCHEDULES NDV

SHEET 5 of 6

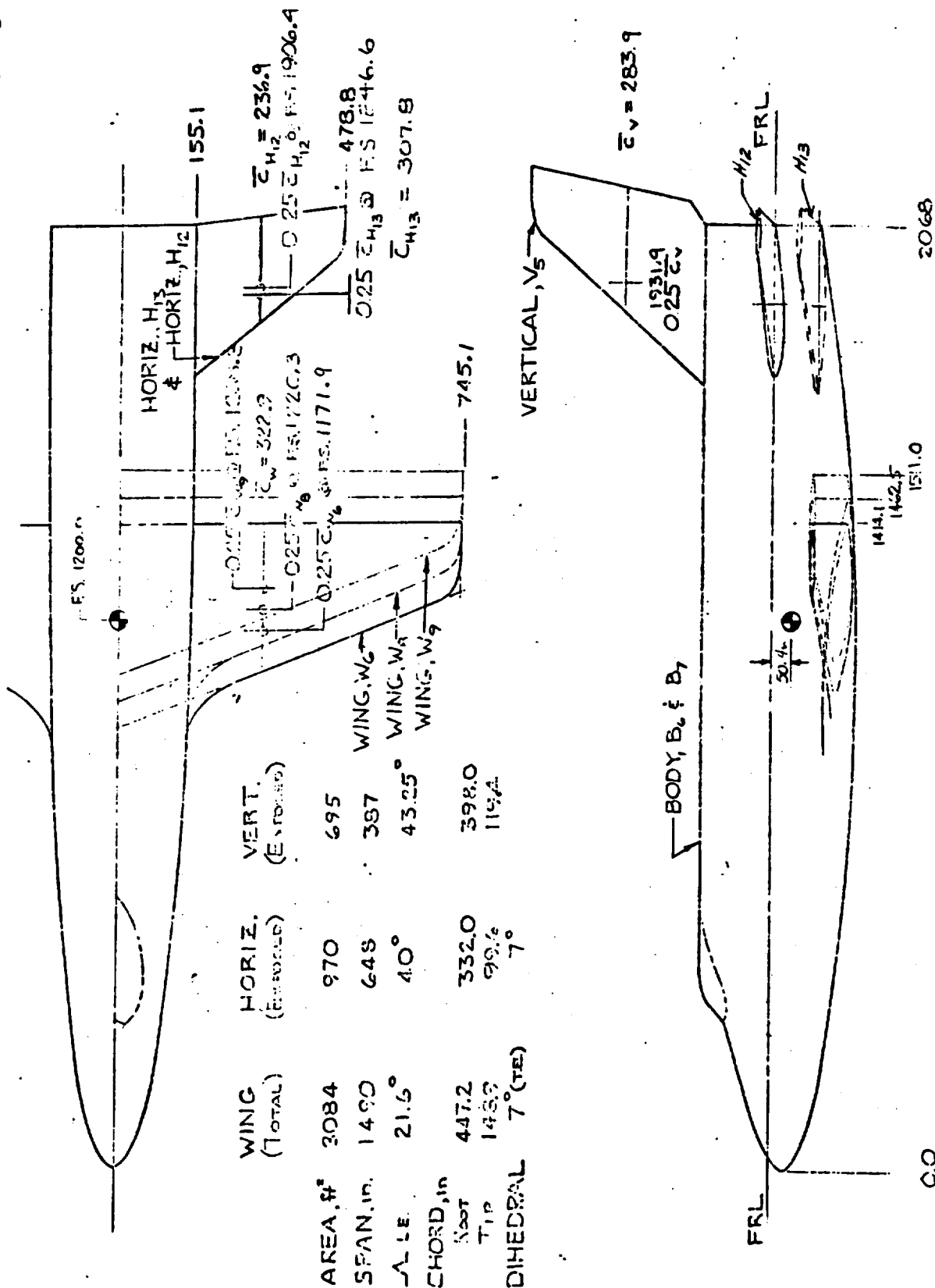


FIGURE 2. STRAIGHT WING ORBITER GENERAL DIMENSIONS

CLM/CNL/D

STRAIGHT WING ORBITER
NR
DR#1034 B-1- 819

176

TEST *** NAAL 632 *** DATA COLLATION SHEET
ALPHA SCHED. A = -4,-2,0,2,4,6,8,10,12,14,16
BETA SCHED. C = -4,-3,-2,-1,0,1,2,3,4,6,8
ALPHA SCHED. D = -4,-2,0,2,4,6,8,10,12,14,16,18,20,25,30
MACH NO. = .259 FOR ALL RUNS
COEFFICIENTS = CL CDF CLM CN CAF CLN CSL CY CLM/CNL/D

```
*****  
* DATA SET *  
* IDENTIFIER *  
*****  
* CONFIGURATION *  
*****  
* SCHEDULE *  
*****  
* ALPHA BETA *  
*****  
* CONTROL DEFL. *  
*****  
* NO. *  
* OF *  
* RUNS *  
*****  
RCG028 B6 N W10 H12 V5 0 C 1  
RCG029 B6 N W10 H12 V5 6 C 1  
RCG030 B6 N W10 H12 V5 12 C 1  
RCG031 B6 W10 H12 A 0 1  
RCG032 B6 W10 H12 A 5 1  
RCG033 B6 W10 H12 0 C 1  
RCG034 B6 W10 H12 6 C 1  
RCG035 B6 W10 H12 12 C 1  
RCG036 B6 W10 N2 H12 A 0 1  
RCG037 B6 N2 W10 H12 A 5 1  
RCG038 B6 N2 W10 H12 0 C 1  
RCG039 B6 N2 W10 H12 6 C 1  
RCG040 B6 N2 W10 H12 12 C 1  
RCG041 B6 N4 W10 H12 A 0 1  
RCG042 B6 N4 W10 H12 A 5 1  
RCG043 B6 N4 W10 H12 0 C 1  
RCG044 B6 N4 W10 H12 6 C 1  
RCG045 B6 N4 W10 H12 12 C 1  
RCG046 B6 W10 V5 A 0 1  
RCG047 B6 W10 V5 A 5 1  
RCG048 B6 W10 V5 0 C 1  
RCG049 B6 W10 V5 6 C 1  
RCG050 B6 W10 V5 12 C 1  
RCG051 B6 N2 W10 V5 A 0 1  
RCG052 B6 N2 W10 V5 A 5 1
```

TEST *** NAAL 632 *** DATA COLLATION SHEET

ALPHA SCHED. A = -4,-2,0,2,4,6,8,10,12,14,16

BETA SCHED. C = -4,-3,-2,-1,0,1,2,3,4,6,8

ALPHA SCHED. D = -4,-2,0,2,4,6,8,10,12,14,16,18,20,25,30

MACH NO. = .259 FOR ALL RUNS

COEFFICIENTS = CL CNF CLM CN CAF CLN CSL CY CLM/CNL/D

DATA SET	CONFIGURATION	SCHEDULE	CONTROL DEFL.	NO.
IDENTIFIER		ALPHA	BETA	HOR ELEVTR
RCG053	B6 N2 W10 V5	0	C	1
RCG054	B6 N2 W10 V5	6	C	1
RCG055	B6 N2 W10 V5	12	C	1
RCG056	B6 N4 W10 V5	A	O	1
RCG057	B6 N4 W10 V5	A	5	1
RCG058	B6 N4 W10 V5	0	C	1
RCG059	B6 N4 W10 V5	6	C	1
RCG060	B6 N4 W10 V5	12	C	1
RCG061	B6 N4 W10 H12 V5	A	0	1
RCG062	B6 N4 W10 H12 V5	A	5	1
RCG063	B6 N4 W10 H12 V5	A	0	1
RCG064	B6 N4 W10 H12 V5	A	5	1
RCG065	B6 N2 W10 H12 V5	A	0	1
RCG066	B6 N2 W10 H12 V5	A	5	1
RCG067	B9 W10 H12 V5	A	0	1
RCG068	B9 W10 H12 V5	A	5	1
RCG069	B9 W10 H12 V5	0	C	1
RCG070	B9 W10 H12 V5	6	C	1
RCG071	B9 W10 H12 V5	12	C	1
RCG072	B9 N2 W10 H12 V5	A	0	1
RCG073	B9 N2 W10 H12 V5	A	5	1
RCG074	B9 N2 W10 H12 V5	0	C	1
RCG075	B9 N2 W10 H12 V5	6	C	1
RCG076	B9 N2 W10 H12 V5	12	C	1
RCG077	B9 W10 H12	A	0	1

-10
-10
-10
-10

TEST *** NAAL 632 *** DATA COLLATION SHEET
ALPHA SCHED. A = -4,-2,0,2,4,6,8,10,12,14,16
BETA SCHED. C = -4,-3,-2,-1,0,1,2,3,4,6,8
ALPHA SCHED. D = -4,-2,0,2,4,6,8,10,12,14,16,18,20,25,30
MACH NO. = .259 FOR ALL RUNS

COEFFICIENTS = CL CDF CLM CN CAF CLN CSL CY CLM/CNL/D

DATA SET	CONFIGURATION	SCHEDULE	ALPHA	BETA	HOR	ELEVTR	NO.	OF	RUNS
RCG078	B9 W10 H12	A	5				1		1
RCG079	B9 W10 H12	0	C				1		1
RCG080	B9 W10 H12	6	C				1		1
RCG081	B9 W10 H12	12	C				1		1
RCG082	B9 W10	A	0				1		1
RCG083	B9 W10	A	5				1		1
RCG084	B9 W10	0	C				1		1
RCG085	B9 W10	6	C				1		1
RCG086	B9 W10	12	C				1		1
RCG087	B9	A	0				1		1
RCG088	B9	A	5				1		1
RCG089	B9	0	C				1		1
RCG090	B9	6	C				1		1
RCG091	B9	12	C				1		1
RCG092	B6 W10 H12E12 V5	D	0			-10	1		1
RCG093	B6 W10 H12E12 V5	D	0		0	-20	1		1
RCG094	B6 W10 H12E12 V5	D	0		0	-30	1		1
RCG096	B6 W10 H12E12 V5	D	0		0	20	1		1
RCG097	B6 W10 H12E12 V5	D	0		0	10	1		1
RCG098	B6 W10 H12E12 V5	D	0		10	10	1		1
RCG099	B6 W10 H12E12 V5	D	0		10	-10	1		1
RCG100	B6 W10 H12E12 V5	D	0		-10	-10	1		1
RCG101	B6 W10 H12E12 V5	D	0		-10	10	1		1
RCG102	B6 N6 W10 H12 V5	D	0		-10	10	1		1
RCG103	B6 N6 W10 H12 V5	A	0				1		1
		0	C				1		1

TEST *** NAAL 632 *** DATA COLLATION SHEET

ALPHA SCHED. A = -4,-2,0,2,4,6,8,10,12,14,16

BETA SCHED. C = -4,-3,-2,-1,0,1,2,3,4,6,8

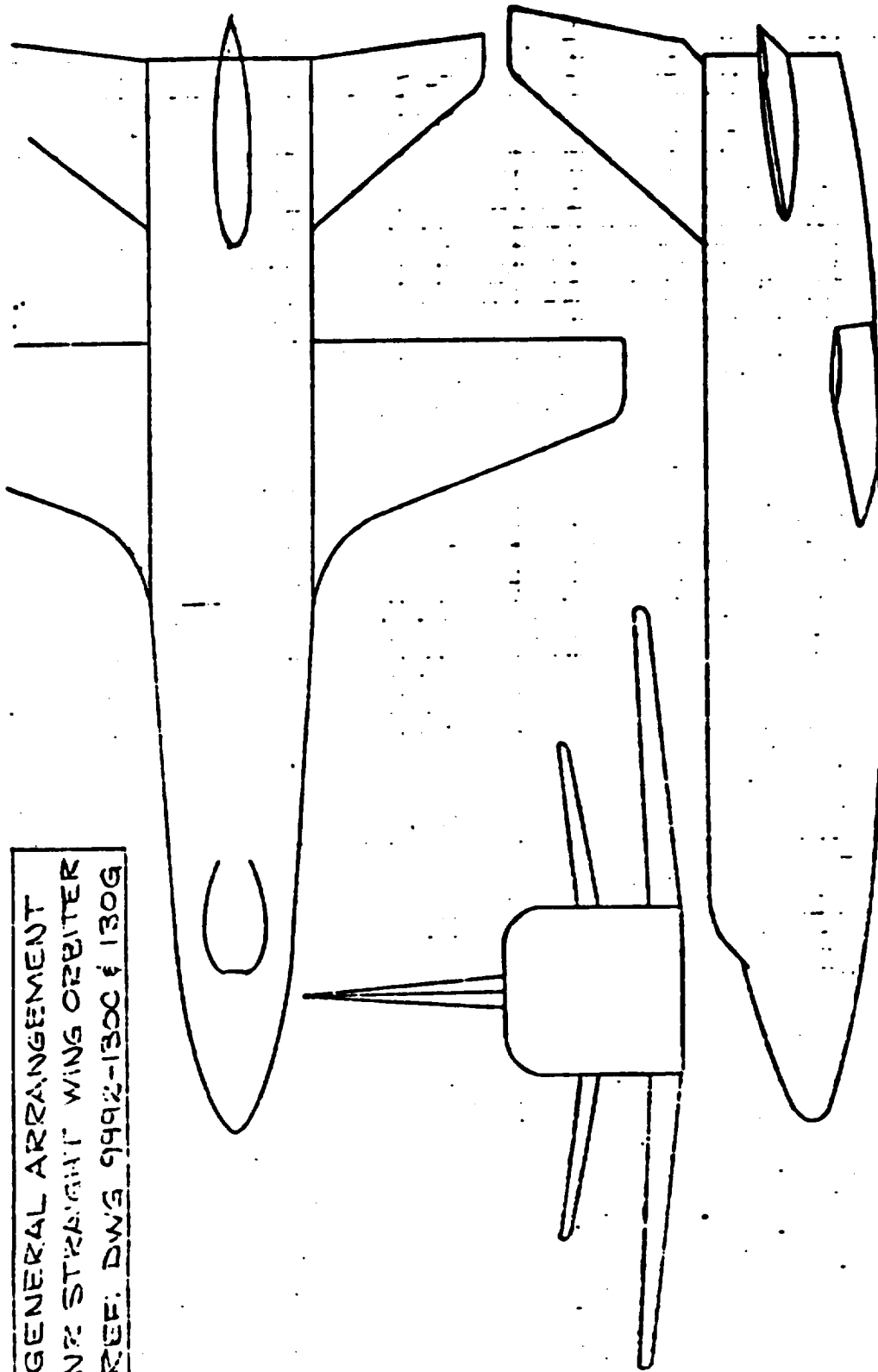
ALPHA SCHED. D = -4,-2,0,2,4,6,8,10,12,14,16,18,20,25,30

MACH NO. = .259 FOR ALL RUNS

COEFFICIENTS = CL CDF CLM CN CAF CLN CSL CY CLM/CNL/D

* DATA SET *	* CONFIGURATION *	* SCHEDULE *	* CONTROL DEFL. *	* NO. *	*****				
* IDENTIFIER *	* *	* ALPHA BETA *	* HOR ELEVTR *	* OF *	*****				
* *	* *	* *	* *	* *	*****				
RCG104	B6 N6 W10 H12 V5	6 C		1	*****				
RCG105	B6 N6 W10 H12 V5	12 C		1	*****				
RCG106	B6N6W10H12E12V5	A 0	0 -10	1	*****				
RCG107	B6N W10H12E12V5	A 0	0 -10	1	*****				
RCG108	B6N W10H12E12V5	A 0	0 10	1	*****				

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

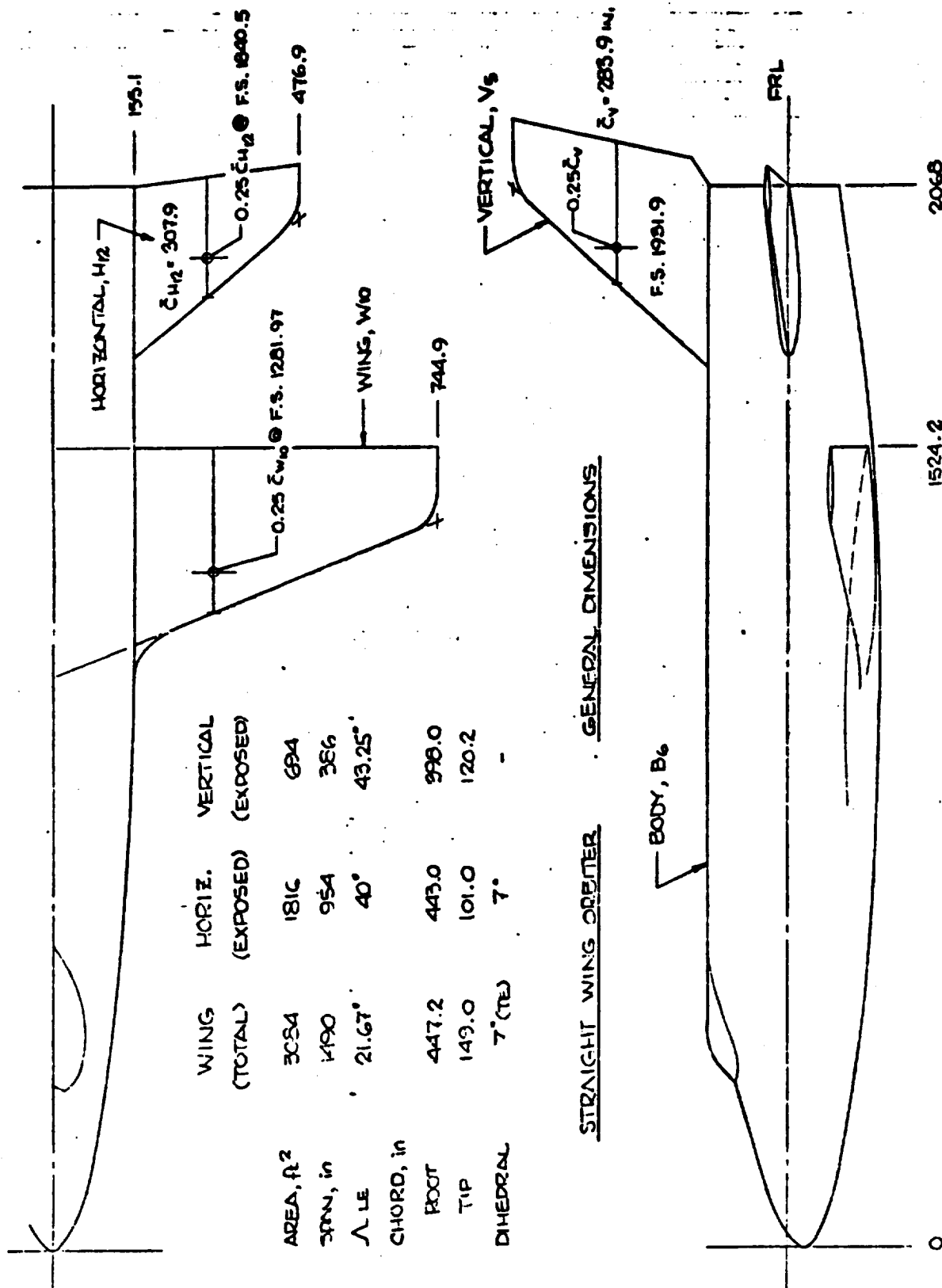


STRAIGHT WING ORBITER
NR
DR#1034 B-1- 825

FIGURE 2. GENERAL ARRANGEMENT OF NR STRAIGHT WING ORBITER

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

FIGURE 3. NAR STRAIGHT WING ORBITER GENERAL DIMENSIONS



TEST LaRC LIFT-52 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES		NO. of RUNS	RN/L x 10 ⁻⁶											
		a	b	ΣH			2.0	2.5	4.0	6.0	8.0	10.0	10.5	11.5	12.0			
RL9001	B6 W10 H12 V5	A	0	0			1		2	3	4	5						6
004								13										
046								12										
044				5							120	121						
002				0	10										7			
003							11		10	9	8							
005								15										
047					-20			14										
036		B	0	0												26		
037							101		100	99	98	97						
038				5												102		
039							107		106	105	104	103						
040				-5													108	
041							113		112	111	110	109						
042				-2						116	115	114						
043				0	-20						118	117						
006								16										
007		C	0	0						24								
048										17								
008																	19	

1 7 13 19 25 31 37 43 49 55 61 67 73 79

BETA 10 (PSF) CN CA ICLN CBL CYN CY CAB1 CAB2 RN/L

COEFFICIENTS: (A) -1, 0, 1, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24
a or b (B) 14, 15, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38
SCHEDULES (C) 44, 45, 48, 52, 56, 58, 60, 62, 64, 66, 69

INDVAR(1) INDVAR(2) INDV

STRAIGHT WING ORBITER
NR
DR#1049 B-1- 827

TEST LARC LPT-52 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES		NO. of RUNS	RN/L x 10 ⁻⁶									
		A	B	SH			2.0	2.5	4.0	6.0	8.0	10.0	10.5	11.5	12.0	
RL9049	B6W10H12V5	C	0	0												
009							28		26		23	21			18	
050							27		25		22	20				
025														73		
026							78		77	76	75	74				
027																
028							84		83	82	81	80			79	
010							29		30	31	32	33				
011														34		
016										45	46	47				
017														48		
018							54		53	52	51	49				
051											50					
012										35	36	37				
013														39		
021	B6W10H12		5	0										61		
022							66		65	64	63	62				
023							67		68	69	72	71				
024														70		

7 13 19 25 31 37 43 49 55 61 67 73 79
BETA 10(PSP)CN CA ICLM FBL CYN ICY CAB1 CAB2 RN/L
COEFFICIENTS: (C) 41 45 48 52 56 58 60 62 64 68 69
a or b
SCHEDULES

NASA-MSFC-44P

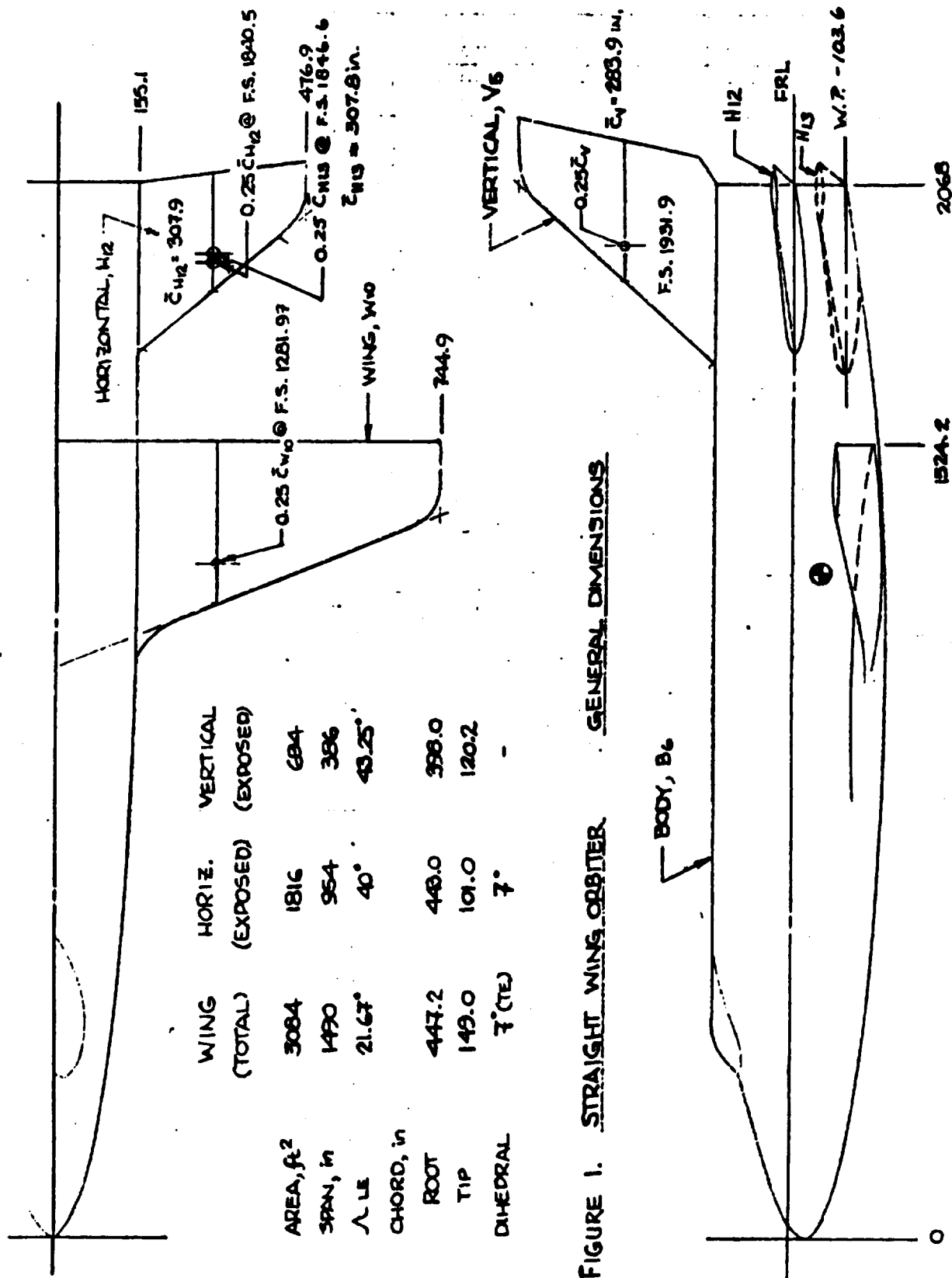
ORIGINAL PAGE IS
OF POOR QUALITY

☐ PRETEST ☒ POSTTEST

[illegible]

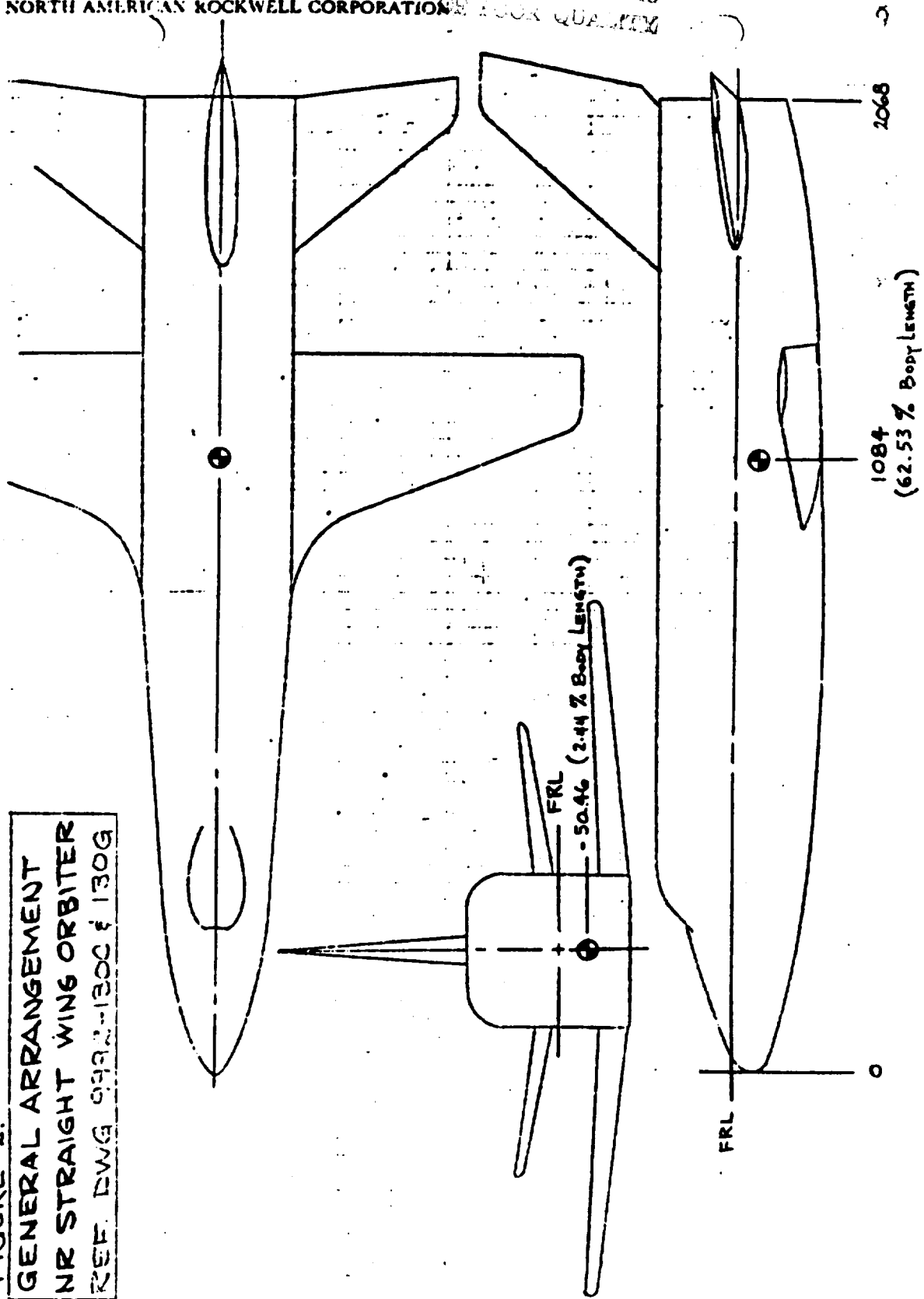
	7	13	19	25	31	37	43	49	55	61	67	73	79
BETA-10(PSE)CN								CAB1	CAB2	RN/L			
COEFFICIENTS:													
a or b	(A)	-1.0	1.2	3.4	5.6	8.10	12.16	18.24	22.28	24			
SCHEDULES	(C)	44.45	48.52	56.58	60.62	64.68	69						

STRAIGHT WING ORBITER
NR
DR#1049 B-1- 829



(ORIGINAL PAGE IS
OF POOR QUALITY)

FIGURE 2.
GENERAL ARRANGEMENT
NR STRAIGHT WING ORBITER
REF DWG 9932-1300 & 1309



STRAIGHT WING ORBITER
NR
DR#1049 B-1-831

STRAIGHT WING ORBITER
NR
DR#1064 B-1- 832

TEST LEG 8' TPT 5-1 DATA SET COLLATION SHEET

ORIGINAL PAGE IS
OF POOR QUALITY

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)				
		A	B			0.4	2.6	0.9	1.2	
RLD 1	B6 W10 H12 Y5 + TR1	A	0°	5h	4	4	1	2	3	
102		B			4	5	6	7	2	
103		C	1		3	12	11	10		
104		A	-5°		3	15	14	12		
105		B			4	19	18	17	16	
106		A	1		3	21	20	20		
107	B6 W10 H12 Y5 + TR2	A	0°		4	24	23	22	26	
108	B6 W10 H12 Y5	A			3	29	28	27		
PLD 009	B6 C W10 H12 Y5	A	1		3	32	31	30		

1 7 13 19 25 31 37 43 49 55 61 67 75.76
P.E.I.A. ORBITER DATA SET COLLATION SHEET
IDPVAR(1) IDPVAR(2) INDV

COEFFICIENTS:

α or β

SCHEDULES

ORIGINAL PAGE IS
OF POOR QUALITY

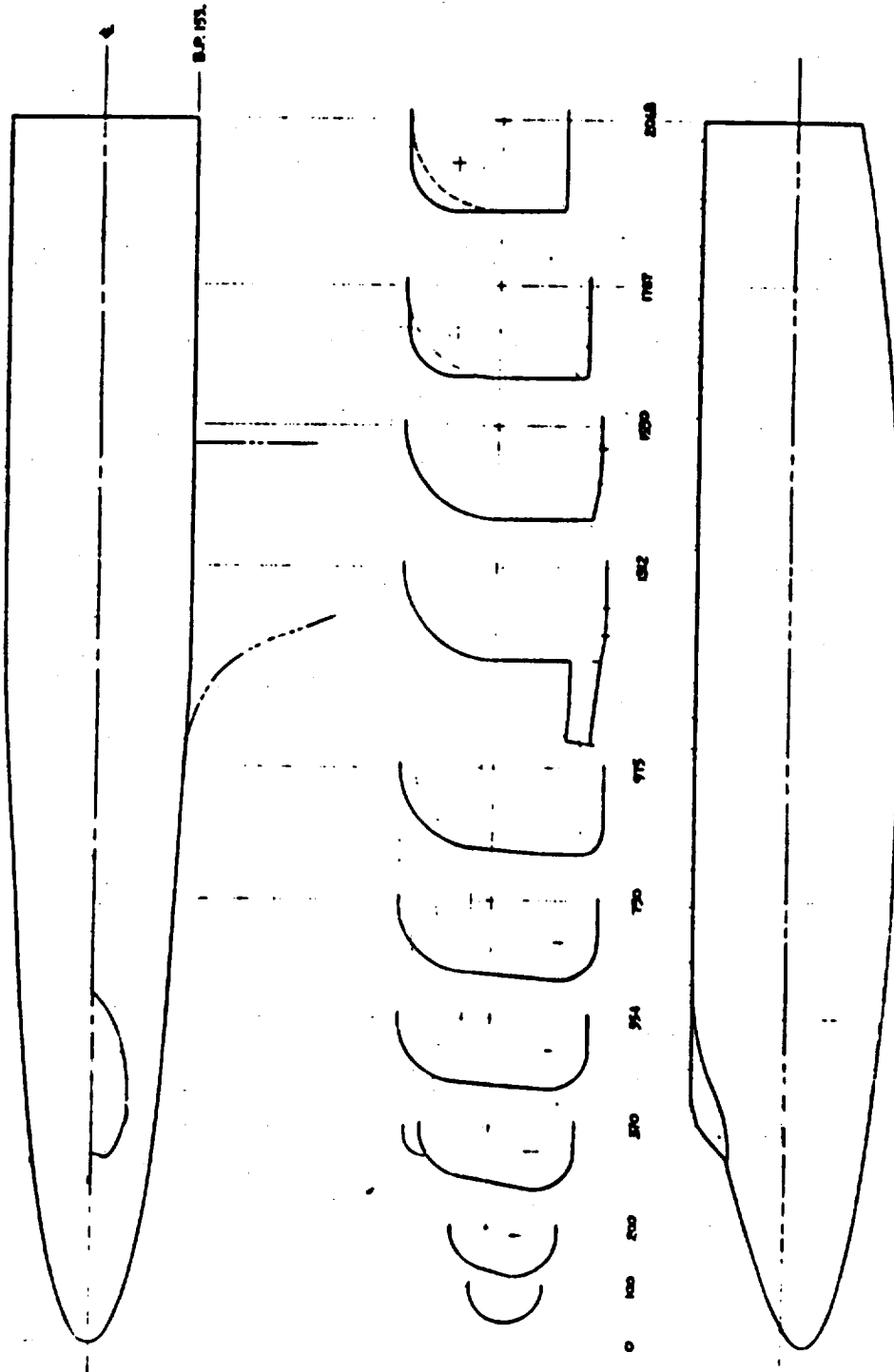
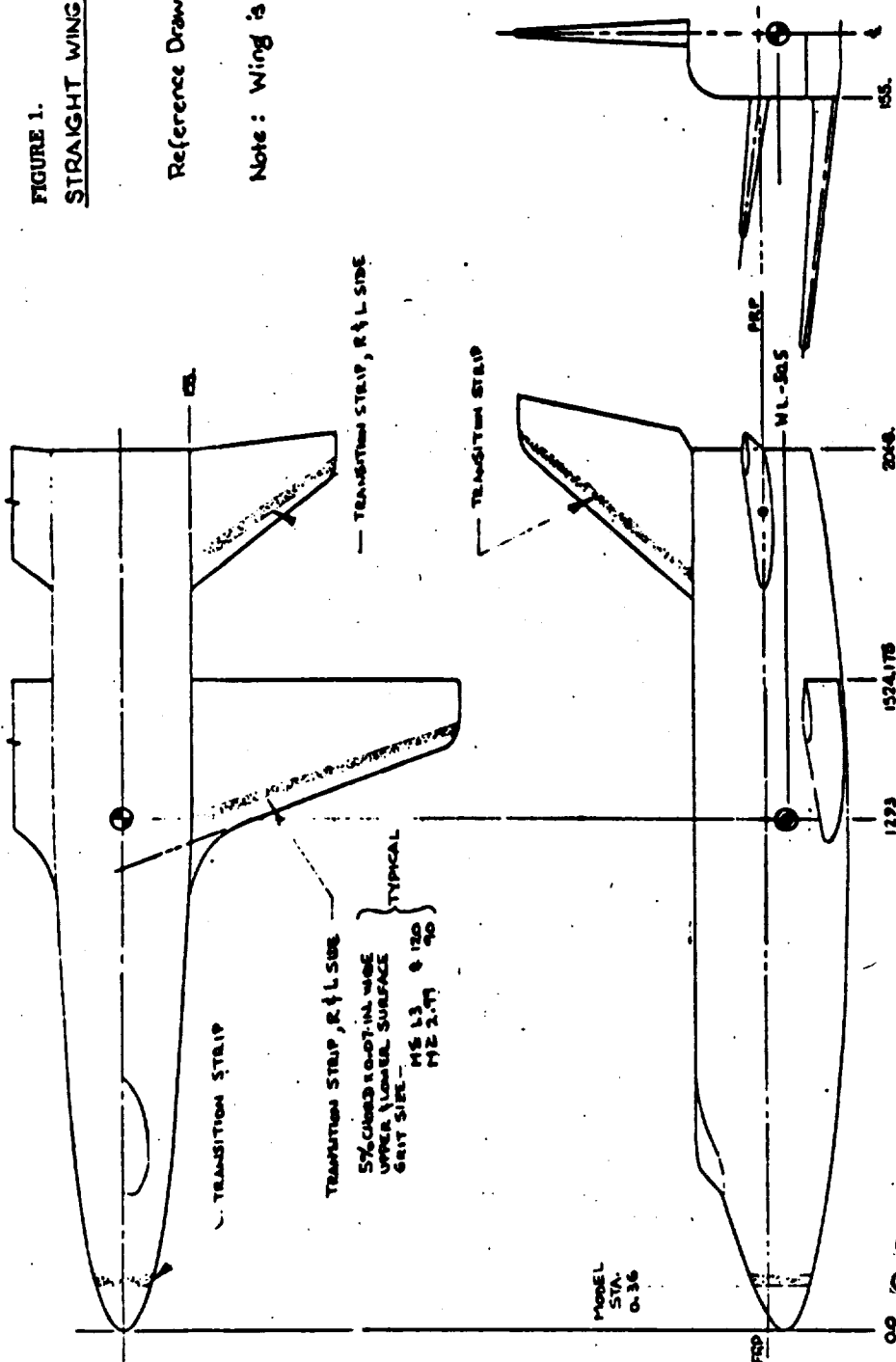


FIGURE 2 BODY B6 9992-120C CONFIGURATION

STRAIGHT WING ORBITER
NR
DR#1064 B-1- 833



ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

STRAIGHT WING ORBITER
NR
DR#1064 B-1-835

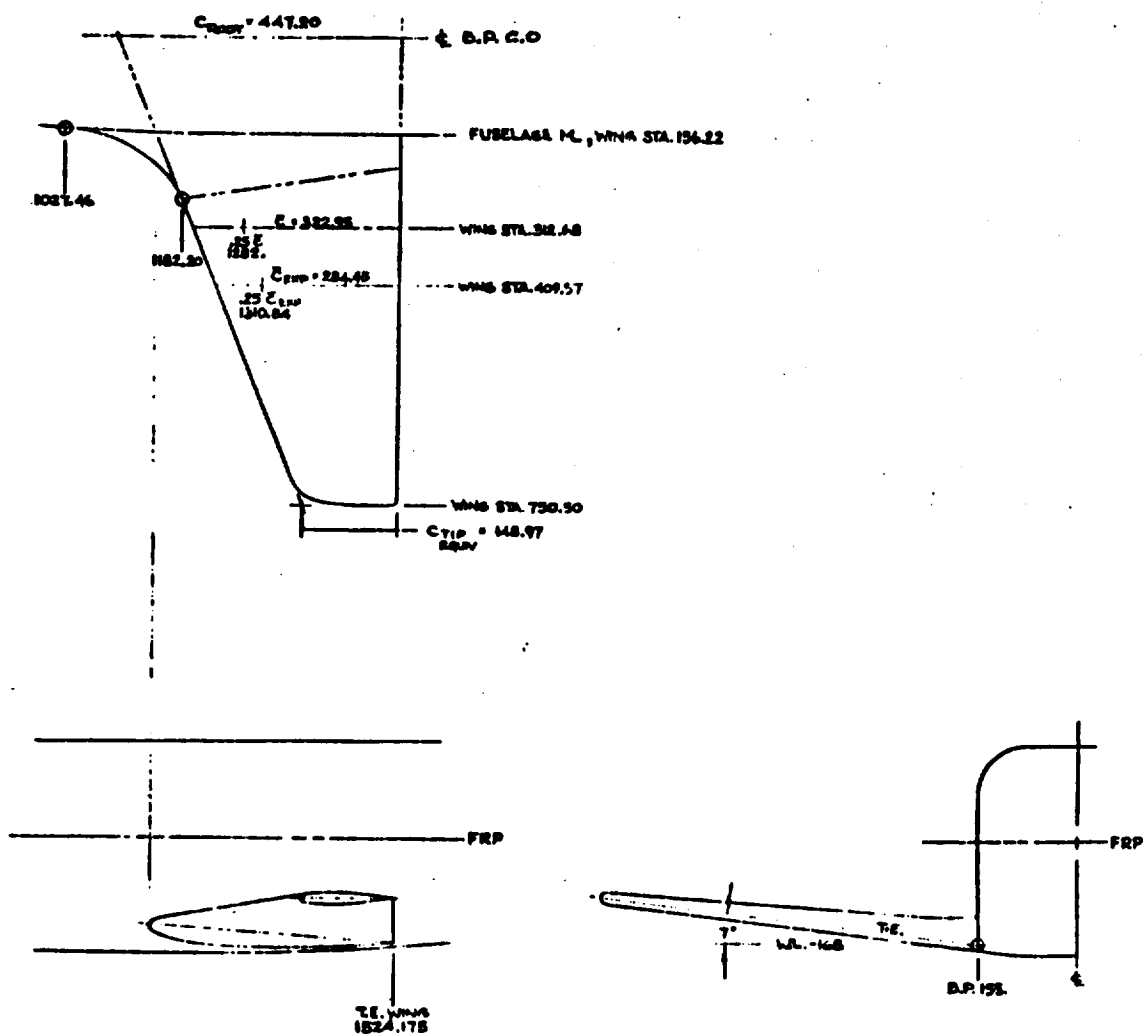


FIGURE 3

WING WIO

9992-130 C CONFIGURATION
9942-130 G WING POSITION

ORIGINAL PAGE IS
OF POOR QUALITY

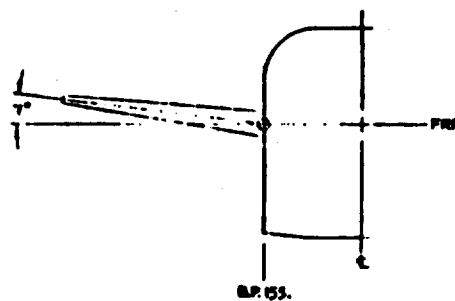
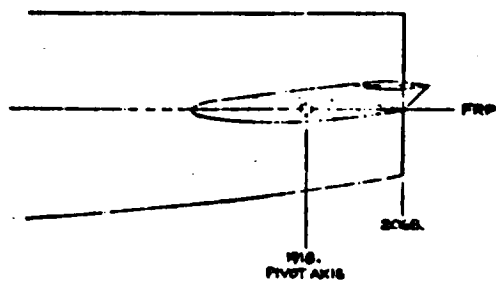
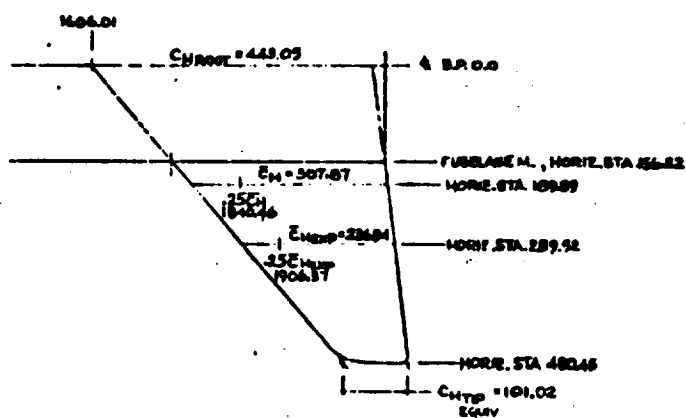


FIGURE 4

HORIZONTAL STABILIZER H12

9992-130C CONFIGURATION

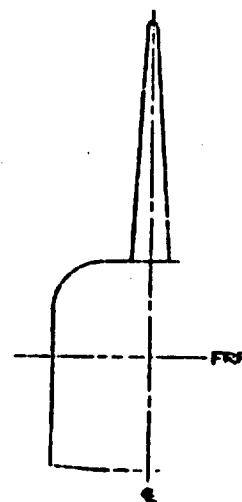
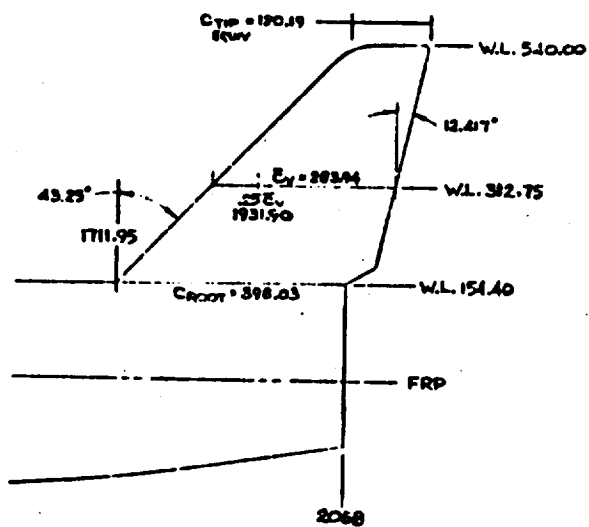


FIGURE 5

VERTICAL STABILIZER V5

9992-130 C CONFIGURATION

TEST LARC UPWT 922 DATA SET ORGANIZATION SHEET

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS					
		α	β	α_H	β_H	γ_H		1.5	2.0				
RLIO42	B6W10H12V5	0°	B	0°		-29°	2	42	48				
RLIO43		10°					↓	43	49				
RLIO44		30°					↓	44	50				
RLIO51		60°					1	↓	51				
RLIO79		0°				-7°	2	79	85				
RLIO80		10°					↓	80	86				
RLIO81		30°					↓	81	87				
RLIO88		60°					1	↓	88				
RLIO55		0°				29°	2	55	61				
RLIO56		10°					↓	56	62				
RLIO57		30°					↓	57	63				
RLIO64		50°					1	↓	64				
RLIO67		0°				59°	2	67	73				
RLIO68		10°					↓	68	74				
RLIO69		30°					↓	69	75				
RLIO76		60°					1	↓	76				
RLIO97	B6	A	0°				2	97	99				
RLIO98			3°				↓	98	100				
RLIO93	B6W10		0°				↓	93	95				
RLIO94			3°				↓	94	96				

ALPHA Schedule A for M = 1.5 -10°→35°

A for M = 2.0 -10°→72°

BETA Schedule B -5°→5°

α or β
SCHEDULES

STRAIGHT WING ORBITER
NR
DR#1069 B-1- 839

[illegible]

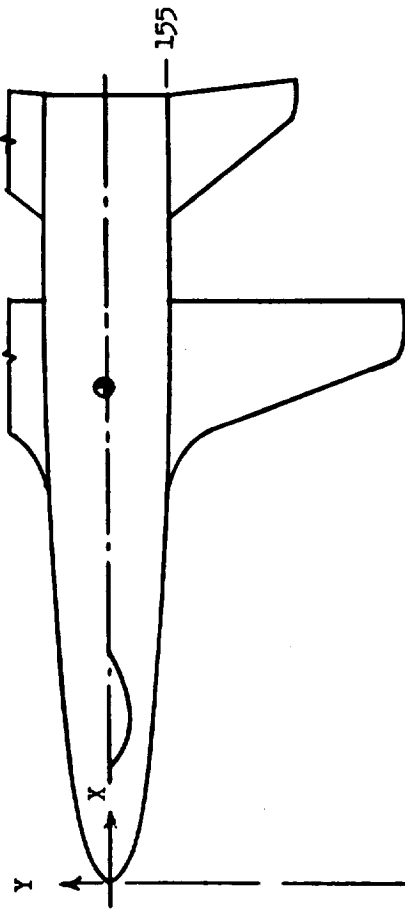
ALPHA Schedule A for M = 1.5 $-10^{\circ} \rightarrow 35^{\circ}$

A for M = 2.0 $-10^\circ \rightarrow 72^\circ$

BETA Schedule B -5°→5°

a or b
SCHEDULES

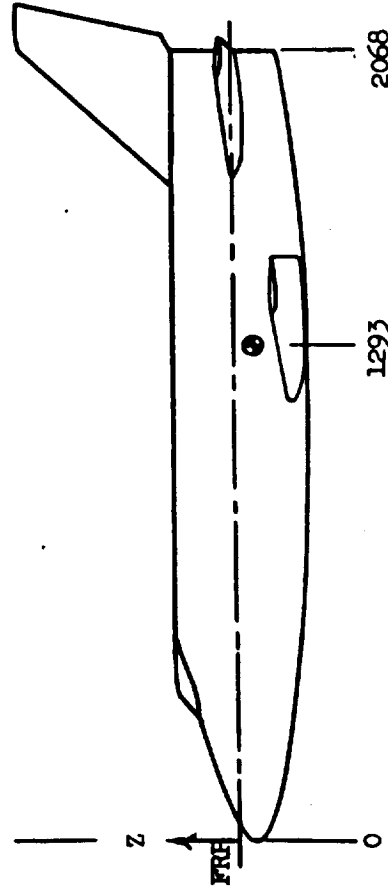
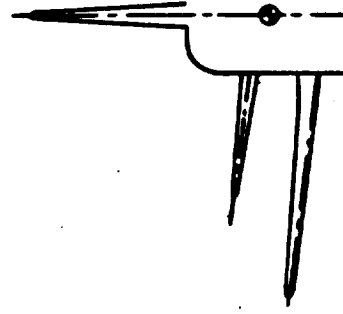
SSD-1.



STRAIGHT WING SSV ORBITER

Reference Drawing 9992-130C

Note: Wing is in -130G position



STRAIGHT WING ORBITER
NR
DR#1069 B-1- 841

FIGURE 2. 943

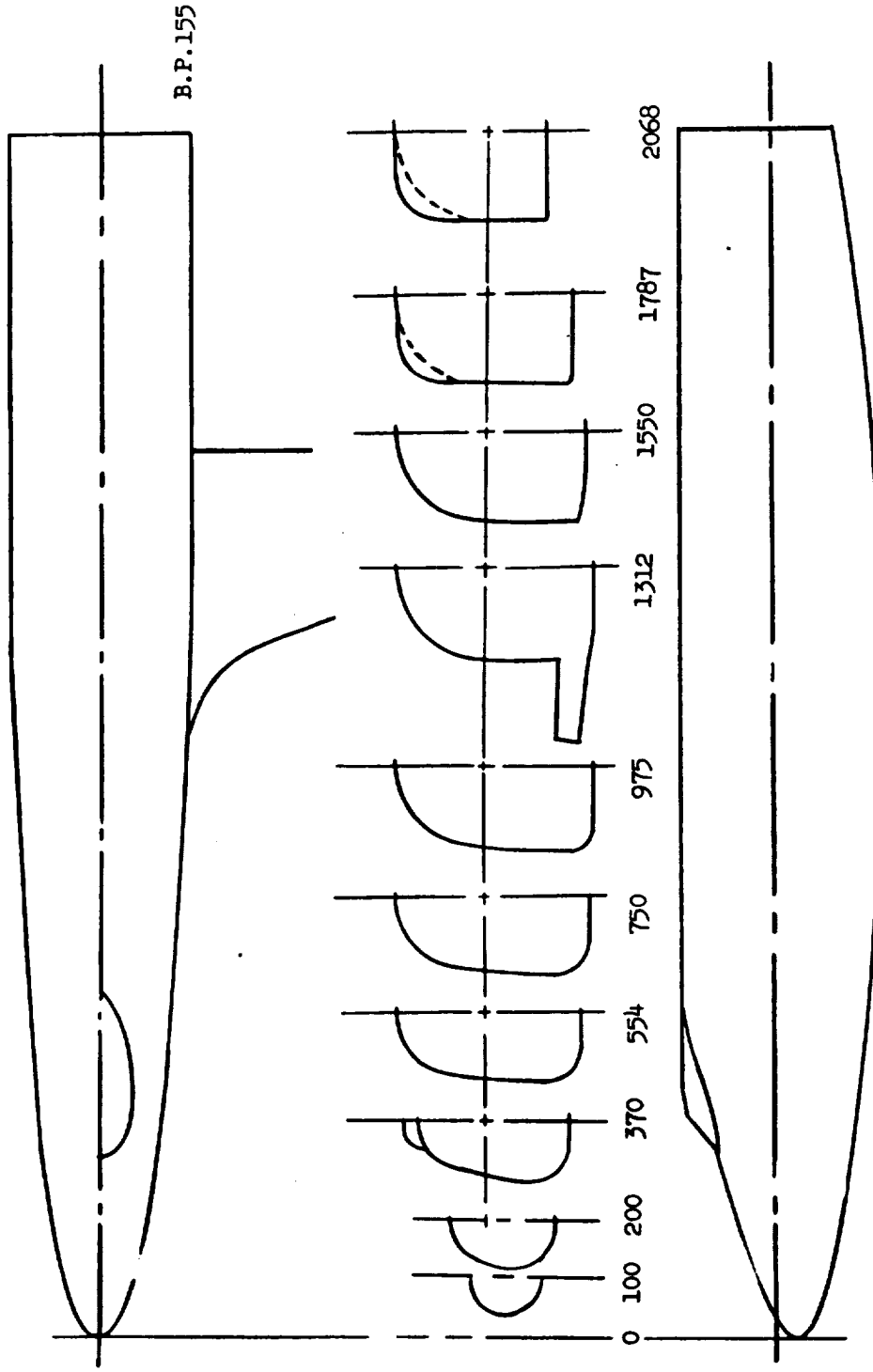


FIGURE 3. BODY B6 9992-130C CONFIGURATION

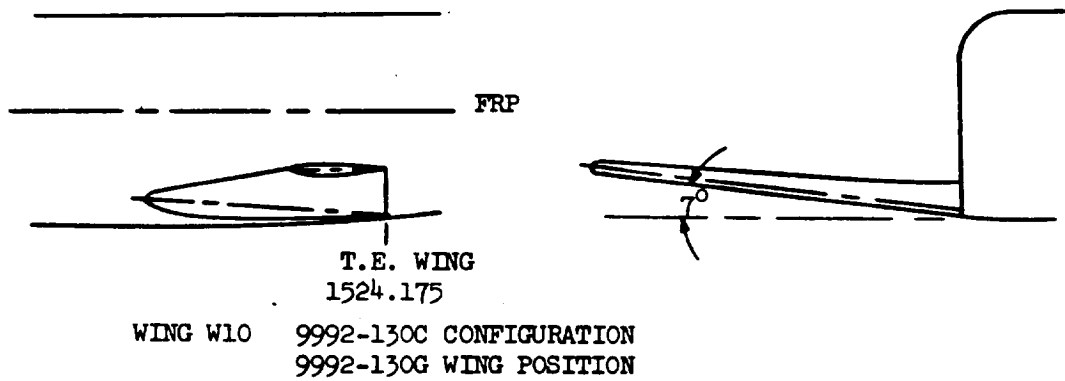
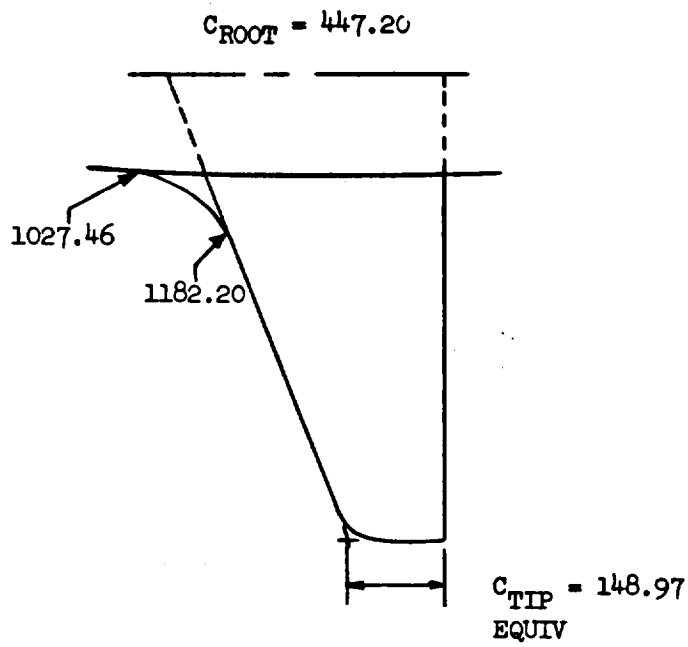


FIGURE 4.

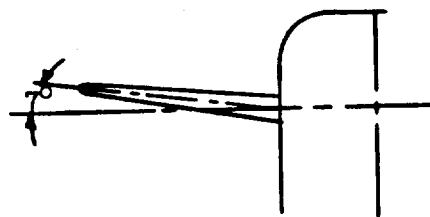
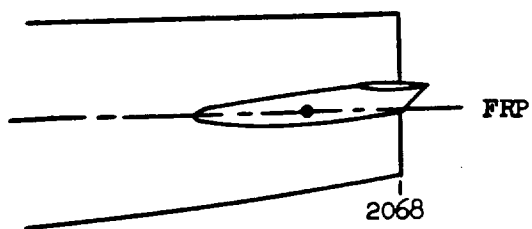
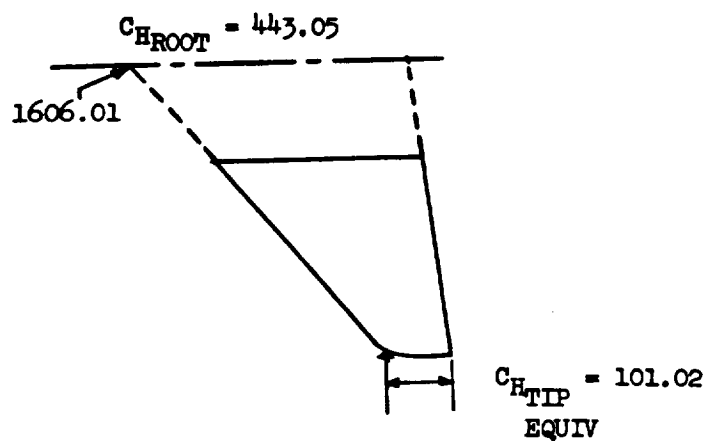


FIGURE 5. HORIZONTAL STABILIZER HL2 9992-130C CONFIGURATION

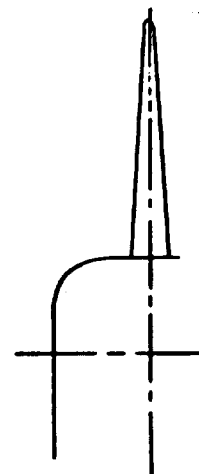
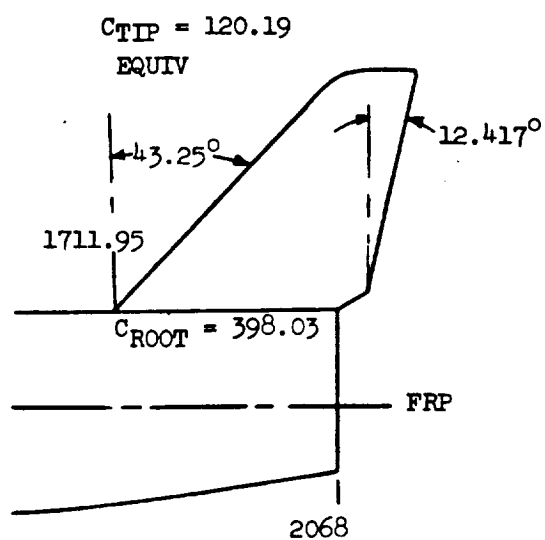


FIGURE 6. VERTICAL STABILIZER V5 9992-130C CONFIGURATION

TEST Ames 66-513 DATA SET COLLATION SHEET

Straight-Wing Orbiter

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	Run Mode	SCLD. #	ε	CONTROL DEFLECTION: δ			NO. OF PULS.	MACH NUMBERS										
					δH	δC	δV		0.25	0.4	0.5	0.6	0.9	1.2	1.5	2.0			
RAF206	B6H12	Push	S	0°	0°	0°	60°	L	5				320	319	318				
216			G	1	-30		60		4				325	324	323				317
226			G	1	+30		60		4				329	328	327				322
23F	B6W10H12		F	1	0		30		6				215	214	213	212	211		
23D			D	1	0		60		5				33	32	31	30	29		
236			G	1	0		60		5				289	288	287		286		
23R			F	1	0		30		3				332		331		330		
23K			K	1	0		45		3				350		349		348		
24F			F	1	-10		30		8		228	227	226	225	224	223	222		
246			G	1	-10		60		7		311	310		309	308	307	306	305	
25F			F	1	+10		30		6		235			234	233	232	231	230	
256			G	1	+10		60		6		304			303	302	301	300	299	
26F			F	1	-30		30		5					221	220	219	218	217	
26G			G	1	-30		60		4					294	293	292		291	
26K			K	1	-30		45		2					352		351			
276			G	1	+30		60		4					298	297	296		295	
28D			D	1	0		60		6					75	74	73	72	71	
29F			F	1	-10		30		5		240			239	238	237		236	
296			G	1	-10		60		5		316			315	314	313		312	

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CN	KAF	KLM	KV	LV	QBL	QAS	QNSF	QSI	QSC	QSC	QSC	QSC	QSC
COEFFICIENTS:													
A = -10, -7, -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100													
D = 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100													
F = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100													
SCHEDULES													
A = -10, -7, -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100													
D = 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100													
F = 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100													

ORIGINAL PAGE IS
OF POOR QUALITY

TEST Ames 66-513 DATA SET COLLATION SHEET

Straight-Wing Orbiter

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	Run Mode	SCHD.		CONTROL DEFLECTION				NO. of RUNS	MACH NUMBERS								1.5	2.0
			a	B	SH	Se	Angle	Time		0.25	0.4	0.5	0.6	0.9	1.2				
RAF30P	B6W10H12	Yaw	60°	E	+40	0°	60°	L	1	184									
31P	↓	Yaw	50°	E	-20		60		1								185		
32F	B6W10H13	Pitch	E	0°	0	30	30		5				245	244	243	242	241		
33F			F		-10	30	30		6	254	253	252	251		250		249		
33G			G		-10	60	60		6	280	279	278	277		276		275		
34F			F		+10	30	30		3				248		247		246		
34G			G		+10	60	60		3				274		273		272		
34K			K		+10	45	45		2				347		346				
35F			F		-30	30	30		3				257		256		255		
35K			K		-30	45	45		2				345		344				
35G			G		-30	60	60		3				283		282		281		
36F			F		+30	30	30		2				259		258				
36G	↓		G		+30	60	60		2				285		284				
37F	B6W10H15		F		0	30	30		6	265			264	263	262	261	260		
37D			D		0	60	60		5				39	38	37	36	35		
38D			D		0	45	45		6	70			64	63	62	61	60		
39F			F		-30	30	30		3				265		264		263		
39G	↓		G		-30	60	60		3				271		270		269		

COEFFICIENTS: See previous page
a or b → IDPVAR(1)
SCHEDULES → IDPVAR(2)

STRAIGHT WING ORBITER
NR
DR#1082 B-1- 847

TEST Ames 66-513 DATA SET COLLATION SHEET

Straight-Wing Orbiter

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	Run Mode	SCHU. a	SCHU. B	CONTROL DEFLECTION			NO. of RUNS	MACH NUMBERS									
					δH	δe	δa		0.25	0.4	0.5	0.6	0.7	1.2	1.5	2.0		
RAFHQA	B6W10H12V5	Pitch	A	0	0	0	0	L	5			24	23	27	26	25		
41A	B6W10H12V5		A	1	0	0	0	S	5			87	86	85	84	83		
42A	B6W10H12V5		A	1	0	0	0	S	5			81	80	79	78	77		
40J			J	0	0	15	15	L	3			335		334		333		
43A			A	-10	-10	0	0	S	2			156						
44A			A	+10	+10	0	0	S	2			154						
45J			J	+10	+10	15	15	L	2			337		336				
46J			J	-30	-30	15	15	L	2			339		338				
47A			A	-10	-10	0	0	S	5			161	160	159		158		
48G		Pitch	Q	0	0	0	0	S	6			177	176	175	174	173		
49E		Pitch	E	0	0	0	0	L	5			182	181	180		179		
50A	B6W10H12V5		A	0	0	-10	-10	S	5			171	170	169		168		
51A			A	0	0	+10	+10	S	5			166	165	164		163		
52A	B6W10H13V5		A	-10	-10	0	0	S	3			148		147		146		
53A			A	+10	+10	0	0	S	3			145		144		143		
54A			A	-30	-30	0	0	S	3			151		150		149		
55A			A	+30	+30	0	0	S	2					153		152		
56J			J	-30	-30	15	15	L	2			343		342				
57A	B6W10H15V5		A	0	0	0	0	S	6			93	92	91	90	89		
58A			A	-30	-30	0	0	S	3			142		141		140		

1 7 13 19 25 31 37 43 49 55 61 67 7576

COEFFICIENTS:
a or B
SCHEDULES
See previous page
IDPVAR(1) IDPVAR(2) IDV

ORIGINAL PAGE IS
OF POOR QUALITY

TEST Ames 66-503 DATA SET COLLATION SHEET

Straight-wing Orbiter

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	Run Mode	SCHD.		CONTROL DEFLECTION			NO. OF RUNS	MACH NUMBERS							
			a	B	SH	SA	SA		0.6	0.9	1.2	1.5	2.0			
RAEO11	B6	Pitch	A	O	-	-	-10°	5								
012			B	O	-	-	55	5	55	54	53	52	51			
021	B8		A	O	-	-	10	5	10	9	8	7	6			
022			B	O	-	-	55	5	60	59	58	57	56			
031	B6W10		A	O	-	-	10	5	5	4	3	2	1			
032			B	O	-	-	55	5	50	49	48	47	46			
041	B6W10H12		A	O	0	0	10	5	15	14	13	12	11			
042			B	O	0	0	55	5	45	44	43	42	41			
052			B	O	-20	-20	55	5	21	20	19	18	17			
062			B	O	-30	-30	55	5	26	25	24	23	22			
072			B	O	-50	-50	55	4	31	30	29	28	27			
047		Yaw	20	K	0	0	20	5	-	35	34	33	32			
049		Yaw	60	K	0	0	60	5	100	99	98	97	96			
081	B6W10H13	Pitch	A	O	0	0	10	5	105	104	103	102	101			
082			B	O	0	0	55	5	65	64	63	62	61			
091	B6W10H12V5		A	O	0	0	10	5	40	39	38	37	36			
093			C	O	0	0	0	5	70	69	68	67	66			
101			A	O	10	10	10	5	90	89	88	87	86			
111			A	O	-10	-10	10	5	75	74	73	72	71			
121			A	O	-30	-30	10	5	80	79	78	77	76			
									85	84	83	82	81			

1	7	13	19	25	31	37	43	49	55	61	67	73	79
CA	KA	KAB	KLM	KY	KYN	KBL							
COEFFICIENTS:													
a or B													
SCHEDULES													
A = -6, -2, 0, 2, 4, 6, 8, 10, 12, 20													
B = 4, 5, 50, 54, 60, 64, 67													
C = -15, -12, -5, -4, -2, 0, 2, 4, 6, 8, 10													
IDPVAR(1) IDPVAR(2) NDV													

STRAIGHT WING ORBITER
NR
DR#1082 B-1- 849

Straight-Wing Order

POSTTEST

[illegible]

COEFFICIENTS:

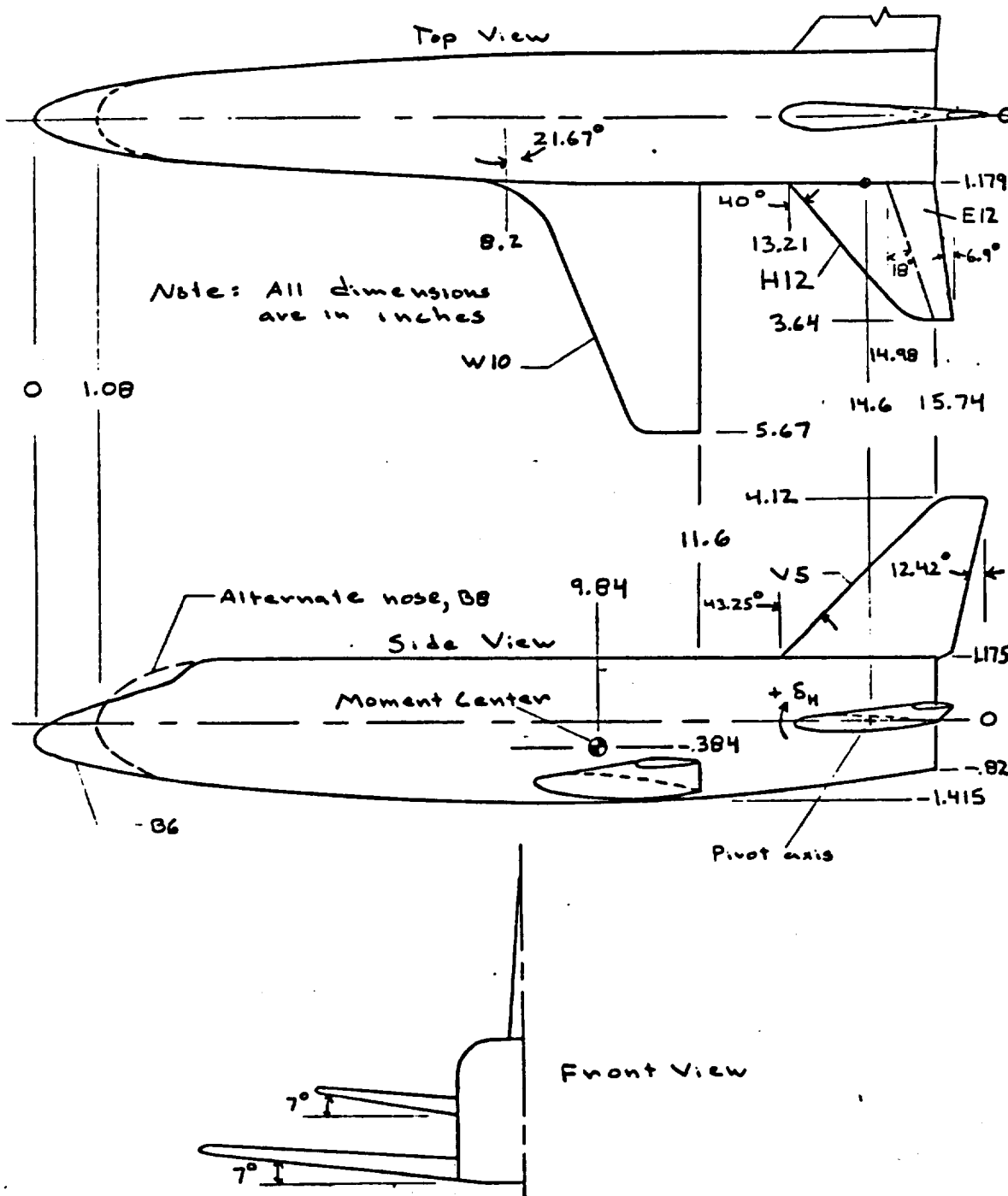
8 0 1 8

SCHEDULES

See previous page

ORIGINAL PAGE IS
OF POOR QUALITY

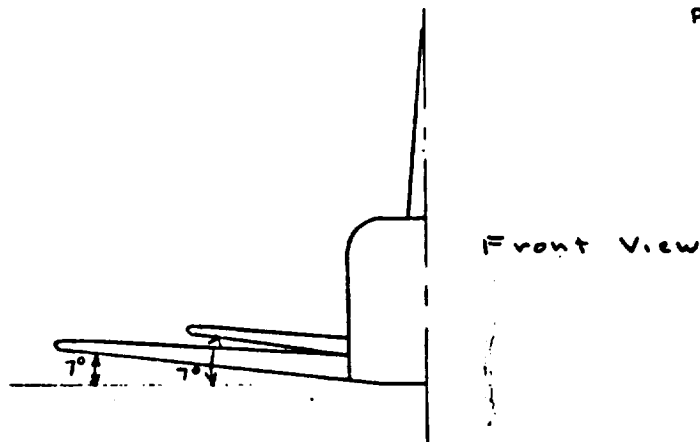
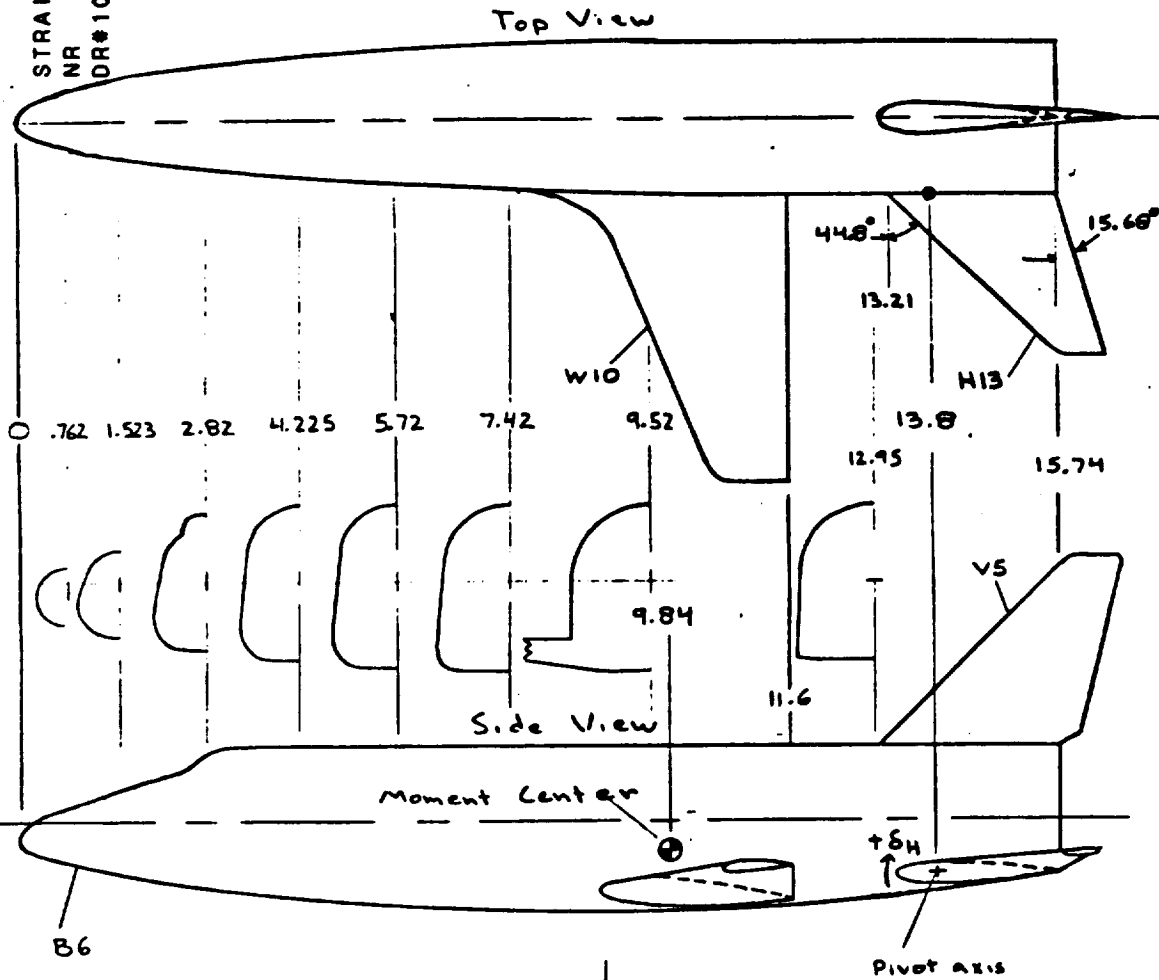
STRAIGHT WING ORBITER
NR
DR#1082 B-1-851



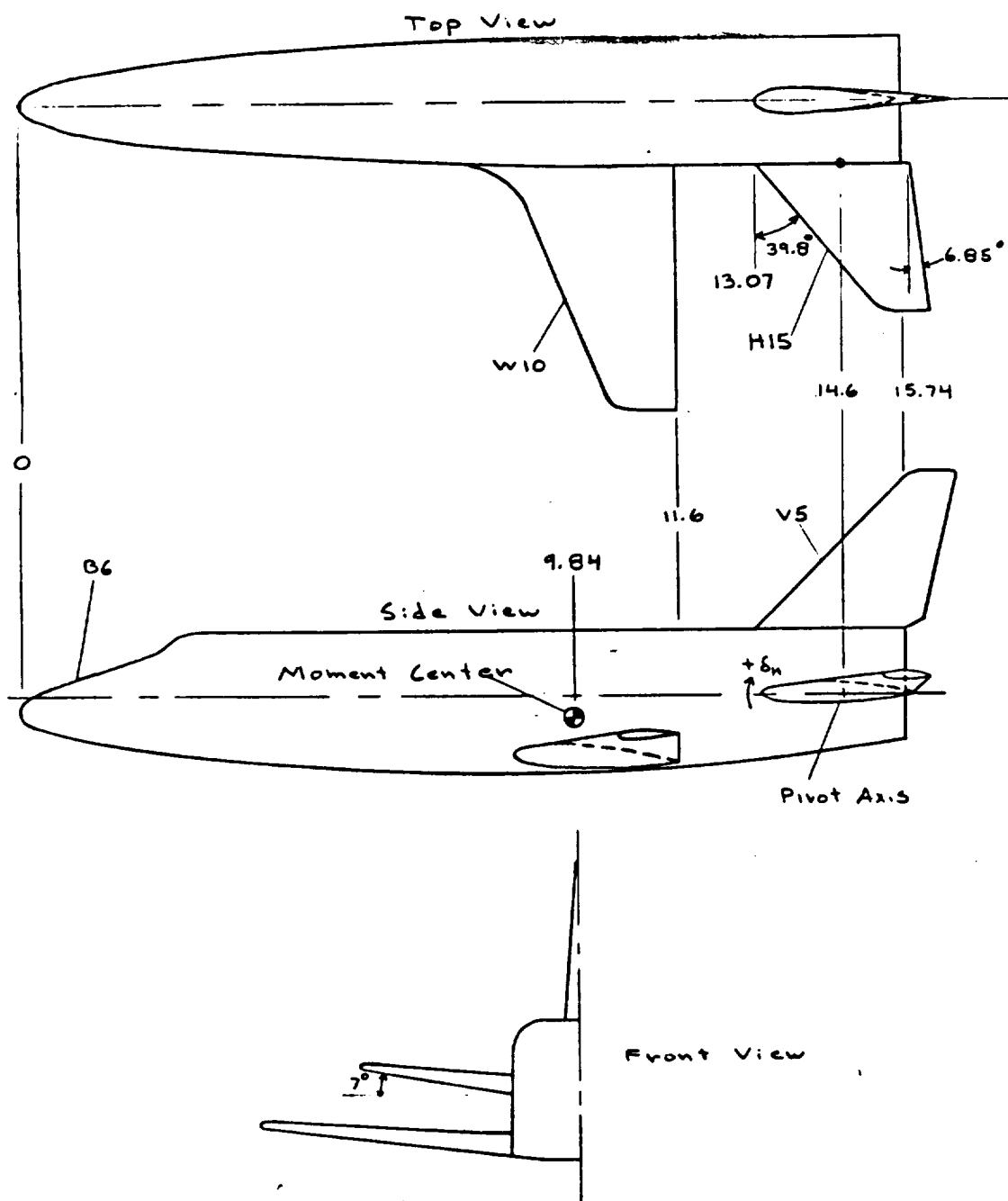
(a) B6 W10 H12 E12 V5

Sketch 1 - Straight-Wing Orbiter, 3-View

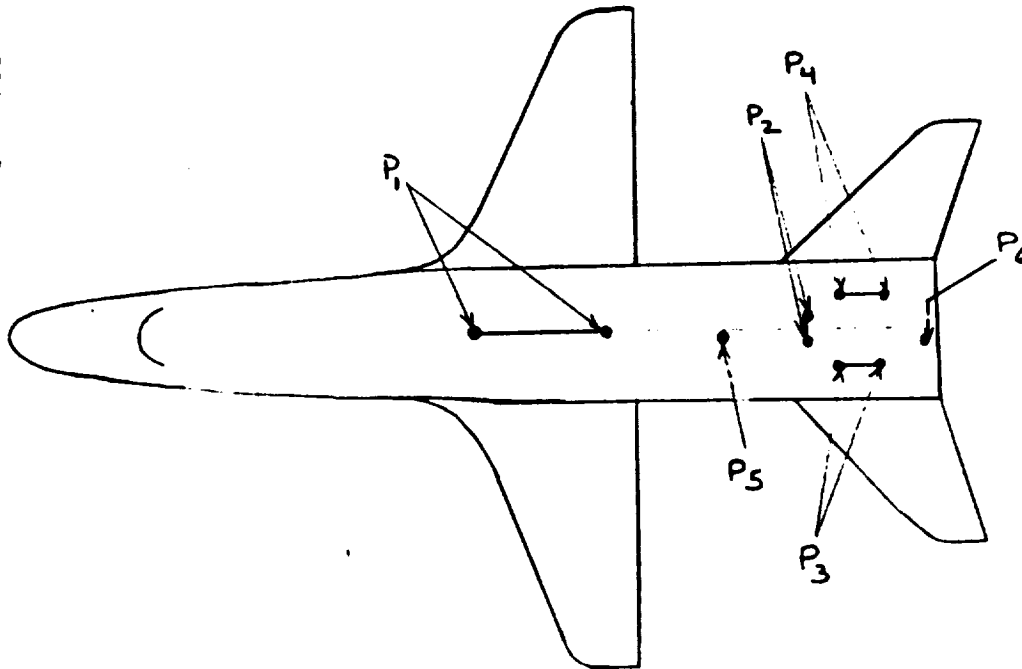
STRAIGHT WING
ORBITER
NR
DR#1082 B-1- 852



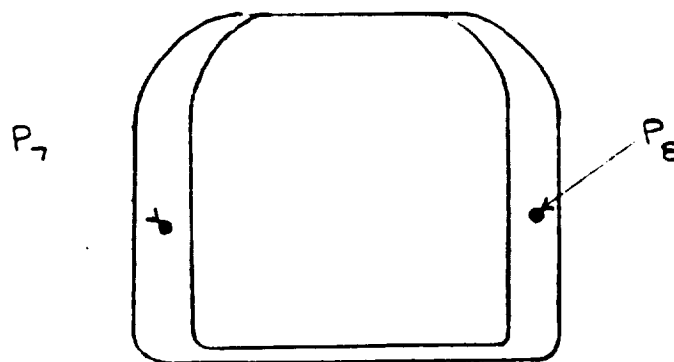
(b) B6 W10 H13 V5
Sketch 1 - continued



(C) B6W10H15V5
Sketch 1 - concluded



TOP VIEW



BASE VIEW

Sketch 3 - Pressure tap locations

TEST ARC 3.5-1028 DATA SET/RUN NUMBER

COLLATION SUMMARY

PAGE 1 OF 3

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES		NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)				10° STING BEND ANGLE	30° STING BEND ANGLE	45° STING BEND ANGLE	<input type="checkbox"/> PRETEST <input checked="" type="checkbox"/> POSTTEST
		a	b	delta	delta		10	20	30	40				
RAK221	B8	0				3	71	A						
RAK222	B8W10	0				3	70	A						
RAK223	B8W10H12	0		0		3	65	A						
RAK331	B6	15	P			1								
2	B6W10					1								
3	B6W10H12			0		1								
4	B6W10H12V5			0		1								
5	B8					1								
6	B8W10					1								
7	B8W10H12			0		1								
RAK338	B8W10H12V5	15		0		1								
RAK331	B6	30				1								
2	B6W10					1								
3	B6W10H12			0		1								
5	B8					1								
RAK336	B8W10	30	P			1								

TEST RUN NUMBERS

7 13 19 25 31 37 43 49 55 61 67 73 76

CN CA CLM CY CYN CBL L/D CAB MACH ALPHA

COEFFICIENTS: IDPVAR(1) IDPVAR(2) IDV

a or b

SCHEDULES

NASA-MSFC-WAF

STRAIGHT WING ORBITER
NR
DR#1104 B-1- 855

TEST AKL 2.5-1018 DATA SET/RUN NUMBER
COLLATION SUMMARY

ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)				TEST RUN NUMBERS												PRETEST	POSTTEST																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		a	b	delta	P ₀	P ₁	P ₂		10° 5 mph Band P ₀ 345	30° 5 mph Band P ₀ 345	45° 5 mph Band P ₀ 345	TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
												Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run			Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run	Run

1 7 13 19 25 31 37 43 49 55 61 67 73 79

COEFFICIENTS: $\alpha(0) = 0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19, 0.20, 0.21, 0.22, 0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.30, 0.31, 0.32, 0.33, 0.34, 0.35, 0.36, 0.37, 0.38, 0.39, 0.40, 0.41, 0.42, 0.43, 0.44, 0.45, 0.46, 0.47, 0.48, 0.49, 0.50, 0.51, 0.52, 0.53, 0.54, 0.55, 0.56, 0.57, 0.58, 0.59, 0.60, 0.61, 0.62, 0.63, 0.64, 0.65, 0.66, 0.67, 0.68, 0.69, 0.70, 0.71, 0.72, 0.73, 0.74, 0.75, 0.76, 0.77, 0.78, 0.79, 0.80, 0.81, 0.82, 0.83, 0.84, 0.85, 0.86, 0.87, 0.88, 0.89, 0.90, 0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00$

SCHEDULES: $\alpha(0) = 0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19, 0.20, 0.21, 0.22, 0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.30, 0.31, 0.32, 0.33, 0.34, 0.35, 0.36, 0.37, 0.38, 0.39, 0.40, 0.41, 0.42, 0.43, 0.44, 0.45, 0.46, 0.47, 0.48, 0.49, 0.50, 0.51, 0.52, 0.53, 0.54, 0.55, 0.56, 0.57, 0.58, 0.59, 0.60, 0.61, 0.62, 0.63, 0.64, 0.65, 0.66, 0.67, 0.68, 0.69, 0.70, 0.71, 0.72, 0.73, 0.74, 0.75, 0.76, 0.77, 0.78, 0.79, 0.80, 0.81, 0.82, 0.83, 0.84, 0.85, 0.86, 0.87, 0.88, 0.89, 0.90, 0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00$

NOTE: $\alpha(0) = 0.12, 0.13, 0.14, 0.15, 0.16, 0.17, 0.18, 0.19, 0.20, 0.21, 0.22, 0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.30, 0.31, 0.32, 0.33, 0.34, 0.35, 0.36, 0.37, 0.38, 0.39, 0.40, 0.41, 0.42, 0.43, 0.44, 0.45, 0.46, 0.47, 0.48, 0.49, 0.50, 0.51, 0.52, 0.53, 0.54, 0.55, 0.56, 0.57, 0.58, 0.59, 0.60, 0.61, 0.62, 0.63, 0.64, 0.65, 0.66, 0.67, 0.68, 0.69, 0.70, 0.71, 0.72, 0.73, 0.74, 0.75, 0.76, 0.77, 0.78, 0.79, 0.80, 0.81, 0.82, 0.83, 0.84, 0.85, 0.86, 0.87, 0.88, 0.89, 0.90, 0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99, 1.00$

COLLATION SUMMARY

☐ PRETEST
☒ POSTTEST
 STING BEND ANGLE

B C D E

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES			NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)										TEST RUN NUMBERS									
		A	B	δh	δf	δe		15°	30°	45°	60°																
RAK3C7	B8W10H12	30°	P	0°	-	1	1																				
RAK3D1	B6	45°		-	-	1	1																				
2	B6W10			-	-	1	1																				
3	B6W10H12			0°	-	1	1																				
5	B8			-	-	1	1																				
6	B8W10			-	-	1	1																				
RAK3D7	B8W10H12	45°		0	-	1	1																				
RAK3E1	B6	60°		-	-	1	1																				
2	B6W10			-	-	1	1																				
3	B6W10H12			0	-	1	1																				
5	B8			-	-	1	1																				
6	B8W10			-	-	1	1																				
RAK3E7	B8W10H12	60°	P	0	-	1	1																				

7 13 19 25 31 37 43 49 55 61 67 73 79

COEFFICIENTS: B(P) = 0.2, 0.8, 1.0, 1.2, 1.4, 1.6
 a or b
 SCHEDULES

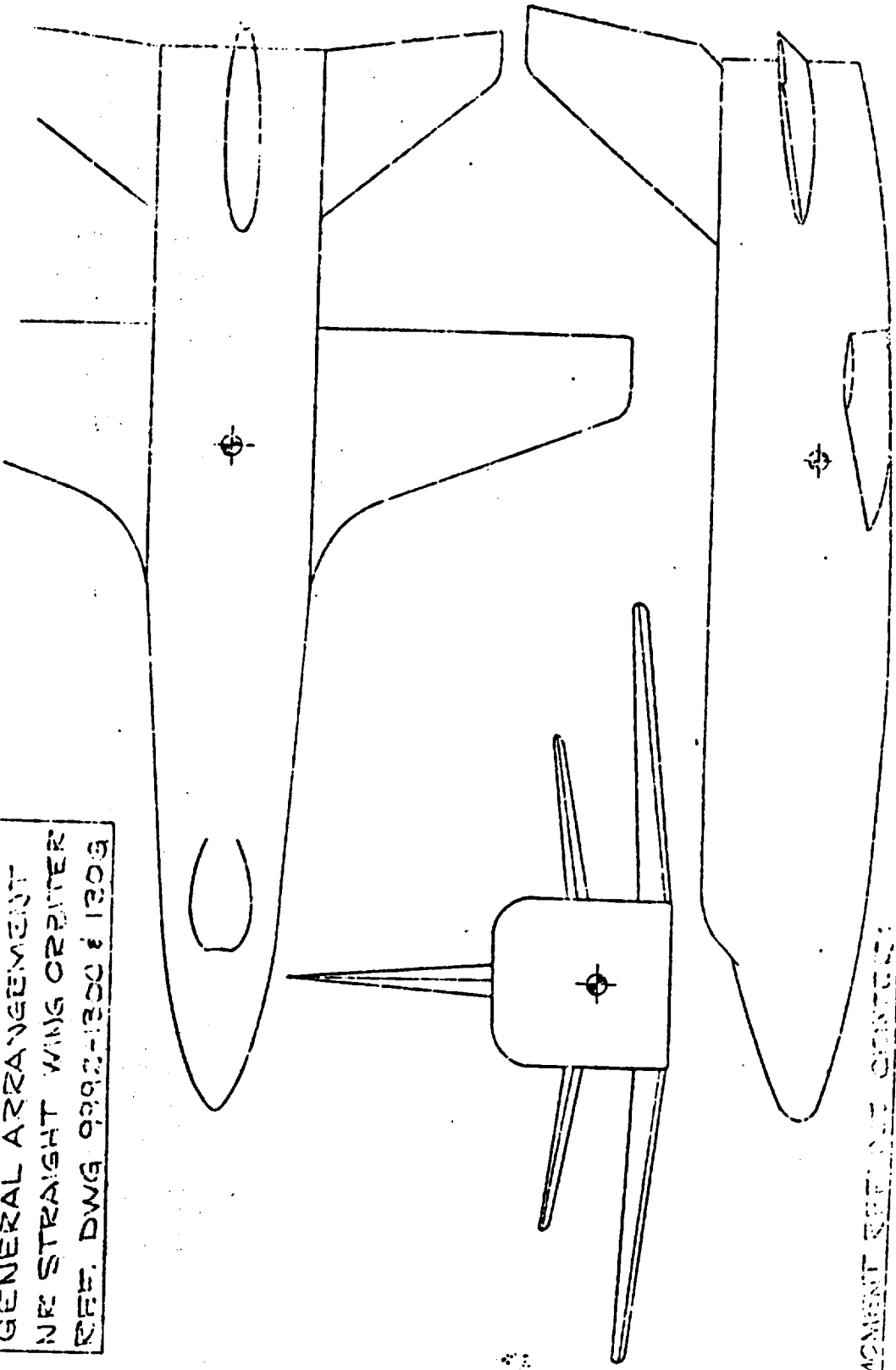
NASA-MSC-MAF

STRAIGHT WING ORBITER
 NR
 DR#1104 B-1-857

STRAIGHT WING ORBITER
NR
DR#1104 B-1- 858

ORIGINAL PAGE IS
OF POOR QUALITY

GENERAL ARRANGEMENT
NR STRAIGHT WING ORBITER
REF. DWG 9892-1300 & 1309

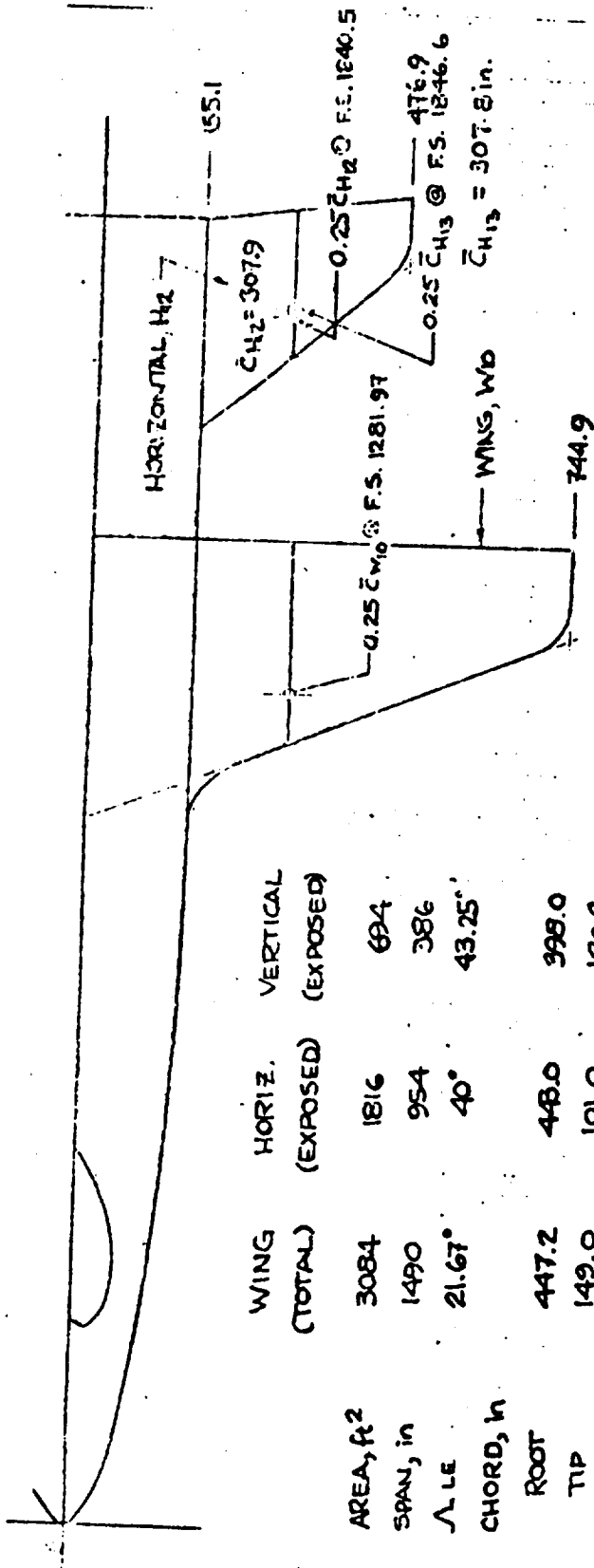


MOMENT REFERENCE CENTER:

X = MS 9890
Y = BP 00
Z = WL -0.394

Figure 5. General Arrangement of NR Straight Wing Orbiter

ORIGINAL COPY OF
OR 100% QUALITY



	WING (TOTAL)	HORIZ. (EXPOSED)	VERTICAL (EXPOSED)
AREA, ft ²	3084	1816	694
SPAN, in	1490	954	386
ANGLE	21.67°	40°	43.25°
CHORD, in			
ROOT	447.2	48.0	398.0
TIP	149.0	101.0	120.2
DHEDRAL	7°(TE)	7°	-

STRAIGHT WING ORBITER
MODEL SCALE 0.00761

GENERAL DIMENSIONS

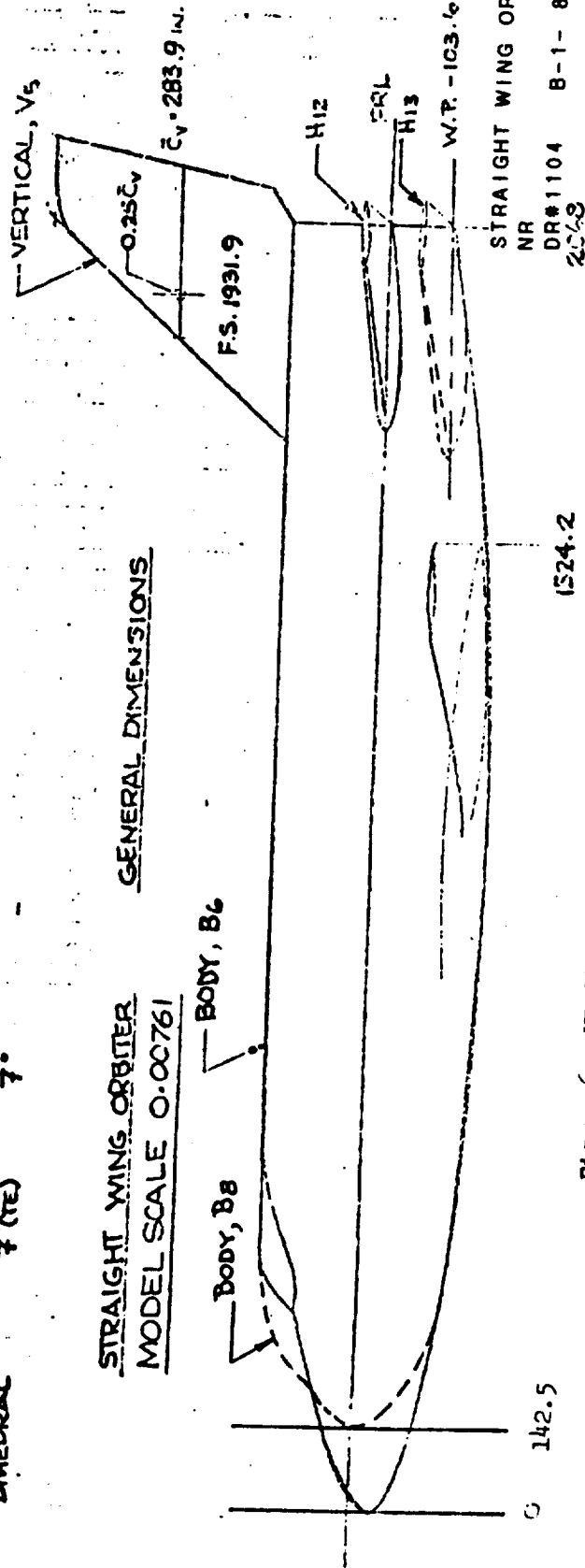


Figure 6. NR Straight Wing Orbiter - Two View

UNIQUE CONFIGS. ORBITER
GAC
DR#1112 B-1- 860

TABLE 1

TEST AMES 66-547 DATA SET COLLATION SHEET

ROS-NB2 ORBITER ALONE IN THE AMES 6X6 WINDTUNNEL
1/75 SCALE

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. OF RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B	δx_1	δx_2	δx_3	δx_4		.3	.6	.8	.9	1.3	1.5	2.0			
R88001	B ₃ N ₁ V ₁	A	0	0	0	0	0	7	8	7	6	5	4	3	1			
R88002	B ₃ W ₁ ⁻⁵ V ₁	K	0	-5	-5	0		6		14	13	12	11	10	9			
R88003	B ₃ N ₁ ¹⁵ V ₁	K	0	+5	-5	0		5		19		18	17	16	15			
R88004	B ₃ W ₁ ⁻⁵ -5V ₁	K	0	-5	-15	0		5		24		23	22	21	20			
R88005	B ₃ N ₁ V ₁ ⁻¹⁰	K	0	0	0	-10		5		29		28	27	26	25			
R88006	B ₃ W ₁ V ₁ ±30	K	0	0	0	±30		5		34		33	32	31	30			
R88007	B ₃ W ₁ ⁻¹⁵ -5V ₁	K	0	-15	-15	0		6		40	39	38	37	36	35			
R88008	B ₃ W ₁ ⁻¹⁰ -15V ₁	K	0	-10	-10	0		6		46	45	44	43	42	41			
R88009	B ₃ N ₁ V ₁ T ₂	K	0	0	0	0		6		52	51	50	49	48	47			
R88010	B ₁ W ₁ V ₁ + TS ₁	J	0	0	0	0		3					55	54	53			
R88011	B ₃ W ₁ V ₁ + TS ₁	J	0	0	0	0		3					53	57	56			
R88012	B ₁ W ₁ V ₁ + TS ₂	J	0	0	0	0		4		62	61	60	59					
R88013	B ₁ W ₁ V ₁	K	0	0	0	0		7		69	68	67	66	65	64	63		
R88014	B ₁ W ₁ V ₁	S	B	0	0	0		4		73		72	71		70			
R88015	B ₃ W ₁ V ₁	S	C	0	0	0		5		78		77	76	75	74			
R88016	B ₃ W ₁ V ₁ T ₂	S	C	0	0	-10		4		82		81	80		79			
R88017	B ₃ W ₁	S	C	0	0	OFF		5		87		86	85	84	83			
R88018	B ₃ W ₁ V ₁ ^{±10}	S	C	0	0	±10		5		92		91	90	89	88			
R88019	B ₃ N ₁ V ₁ F ₁ ⁻¹⁵	K	0	0	0	0	-15	5		97		96	95	94	93			
R88020	B ₃	L	0	OFF	OFF	OFF	0	4		101		100	99		98			

1	7	13	19	25	31	37	43	49	55	61	67	73	79
CL	ICD	ICLN	ICV	ICLN	CSL	QDF	ICAB						
COEFFICIENTS:													IDPVAR(1) IDPVAR(2) IDV
a or b													
SCHEDULES													
$\alpha A = 0, \pm 1, \pm 2, \pm 3, \pm 4, 5, 6, 8, 10, 12, 14, 16, 18, 20$ $\alpha K = 0, \pm 2, \pm 4, 6, 8, 10, 12, 14, 16, 18, 20$ $\alpha B = 0, \pm 1, \pm 2, \pm 3, \pm 4, 6, 10$ $\alpha C = 0, \pm 2, \pm 1, \pm 1/2, \pm 2, \pm 3, \pm 4, 6, 8, 10$													

NASA-MSC-MAP

TABLE 1 (continued)

TEST AMES 66-547 DATA SET COLLATION SHEET

☐ PRETEST ☒ POSTTEST

[illegible]

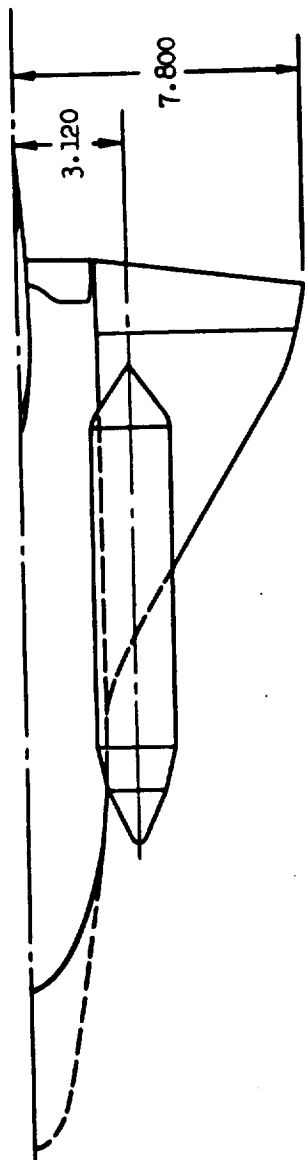
	1	7	13	19	25	31	37	43	49	55	61	67	73
CL													
CD													
CM													
CY													
ICLN													
CSL													
QPF													
CAB													

COEFFICIENTS:

$\alpha K = 0 \pm 2 \pm 4.6.8.10.12.14.16.18.20$

$\rightarrow \text{IDPVAR}(1) \text{ IDPVAR}(2) \text{ INDV}$

UNIQUE CONFIGS. ORBITER
GAC
DR#1112 B-1-861



Model dimensions in inches

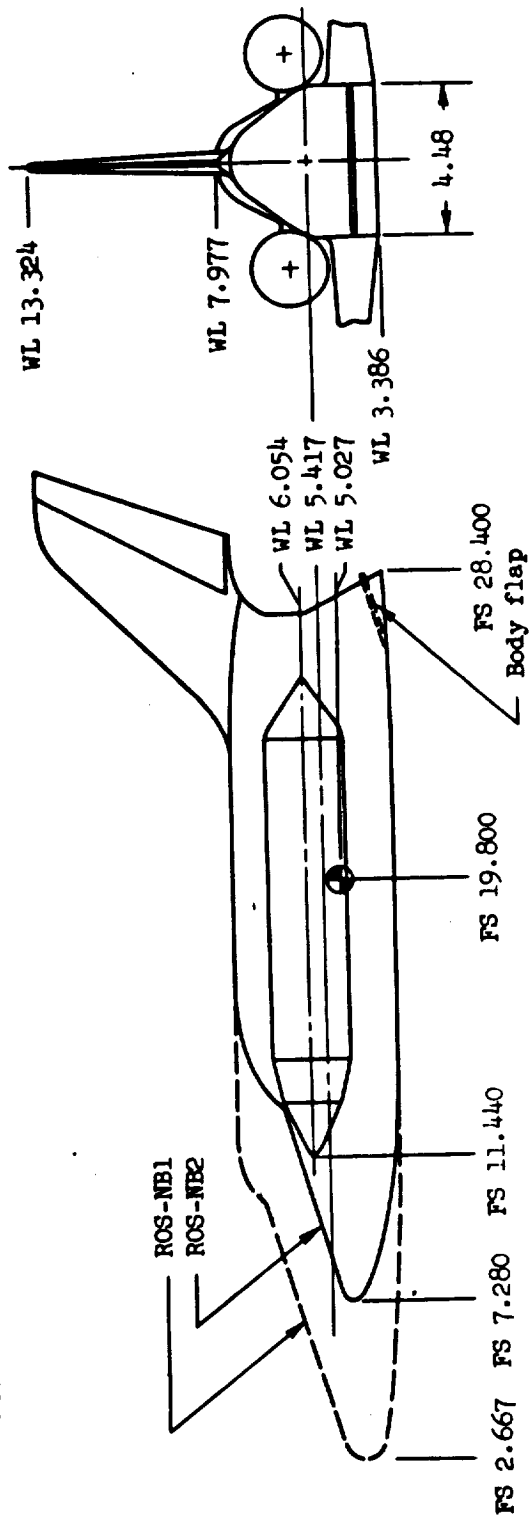
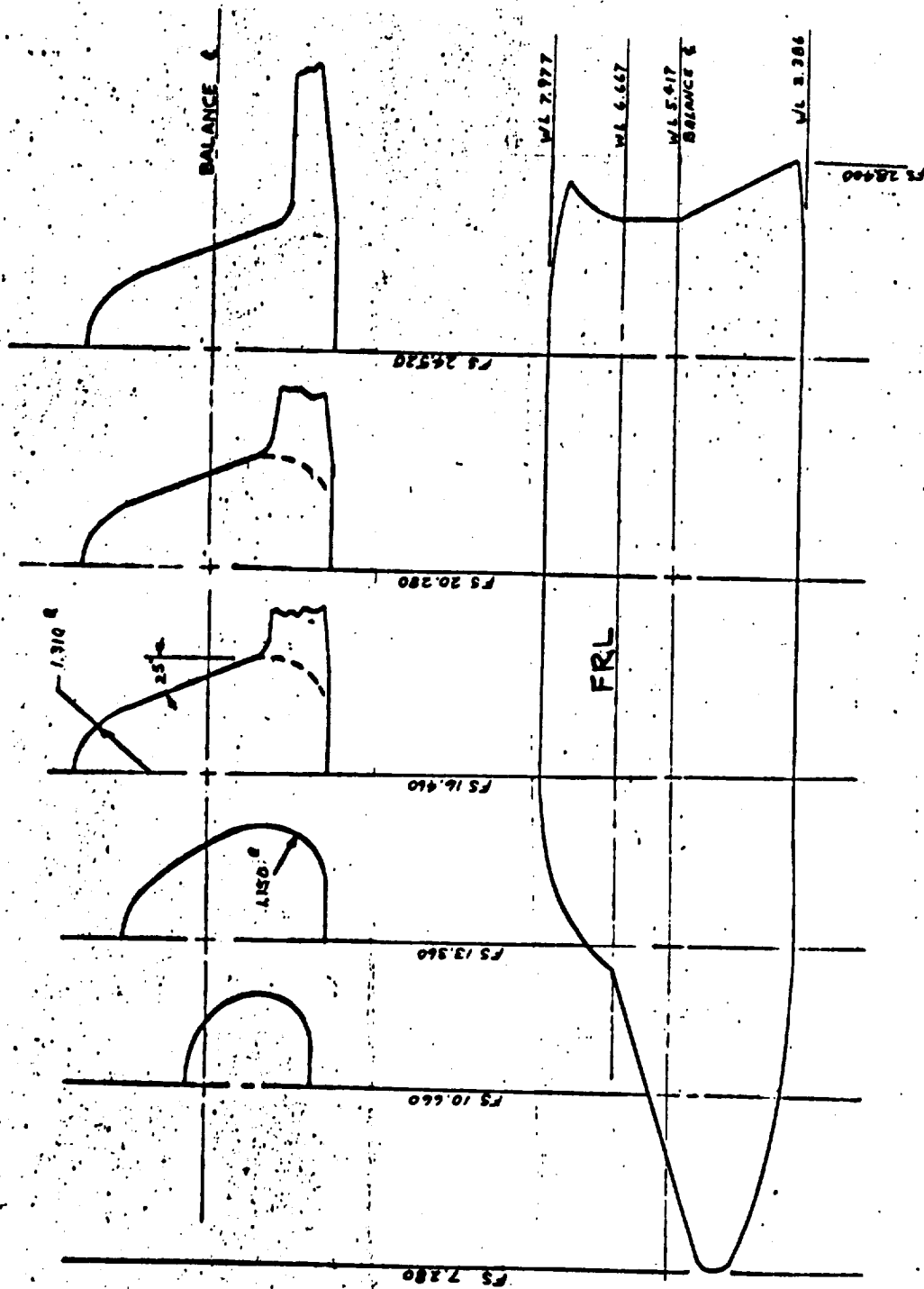


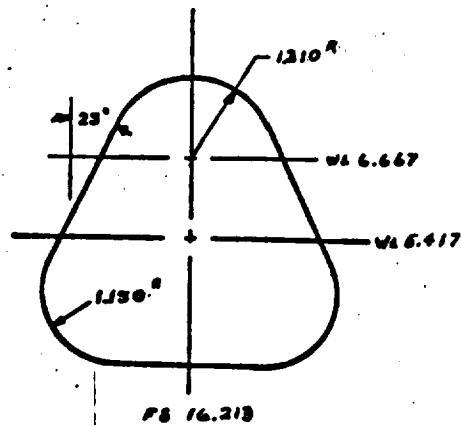
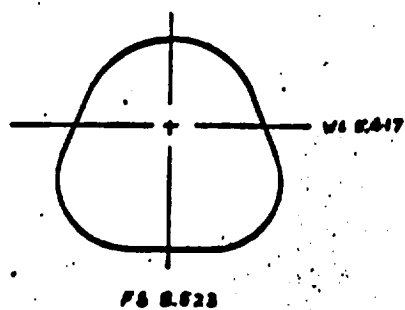
Figure B-. Three view - ROS-NB1 and ROS-NB2 configurations.

Model dimensions in inches

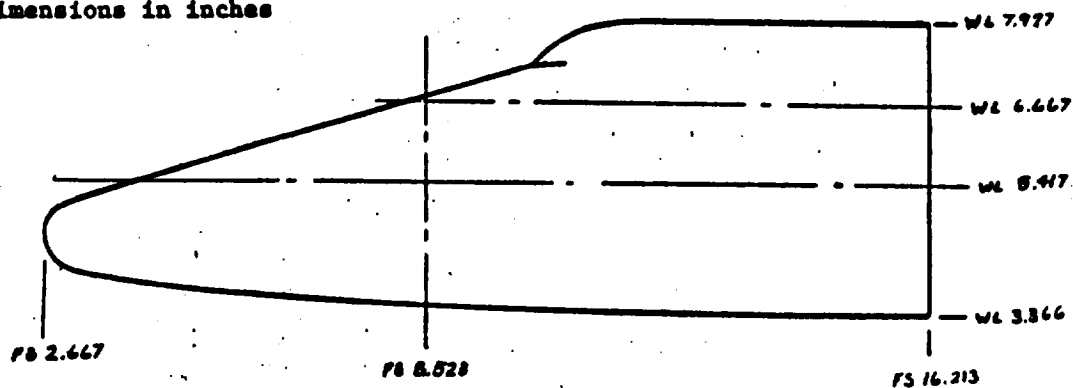


UNIQUE CONFIGS. ORBITER
GAC
DR#1112 B-1- 863

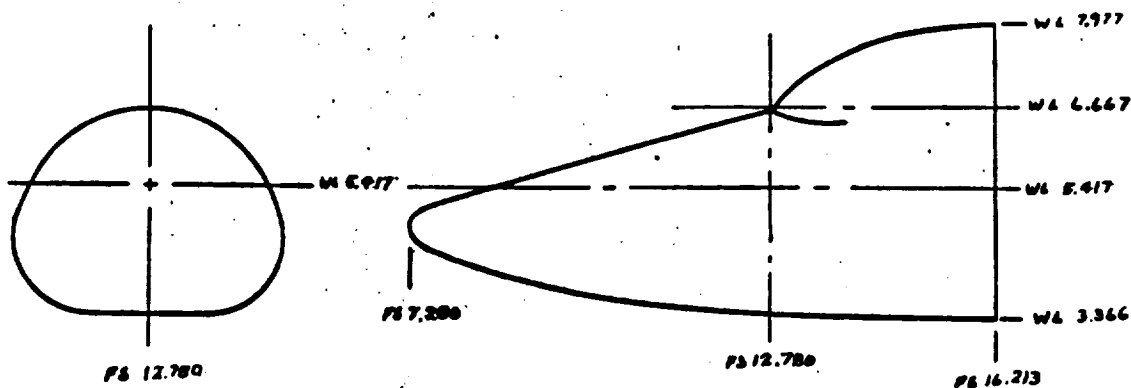
Figure C. - ROS-NB2 Body



Model dimensions in inches



ROS-NB1



ROS-NB2

Figure D. - Nose Shapes

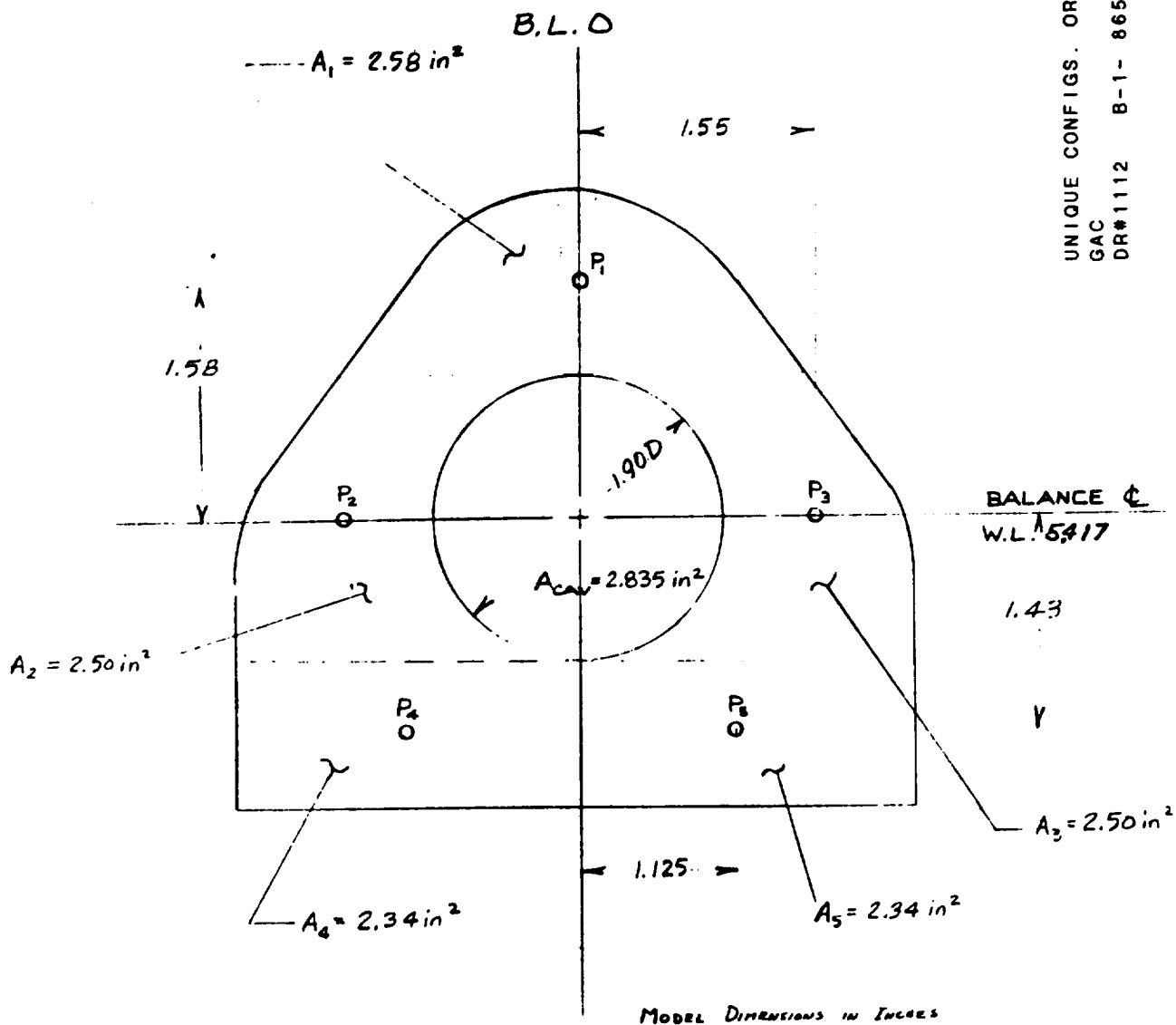
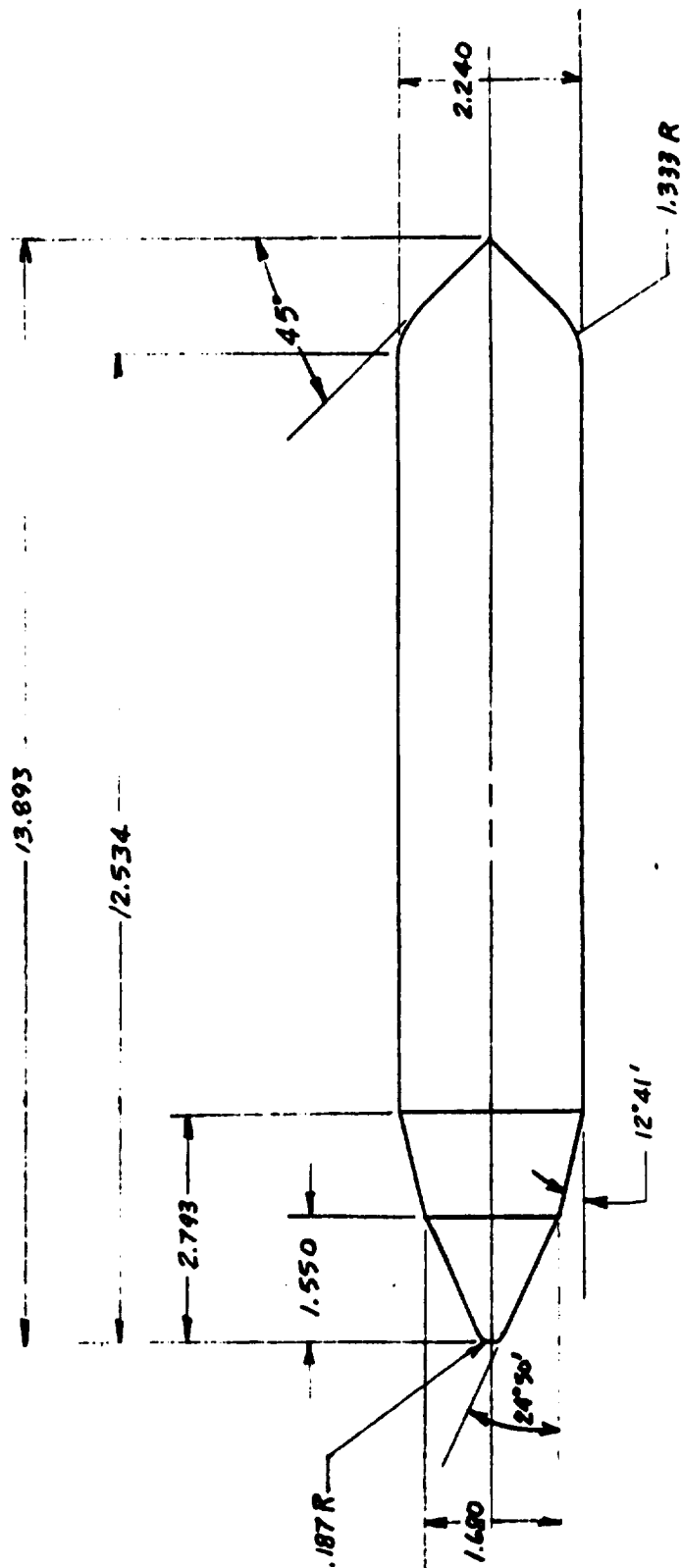


Figure E. - Base Pressure Taps (1/75 Scale Orbiter)

UNIQUE CONFIGS. ORBITER
GAC
DR#1112 B-1- 866



MODEL DIMENSIONS IN INCHES

Figure F. - Conical Tank - T₂ (1/75 Scale)

ORIGINAL PAGE IS
OF POOR QUALITY

TEST LTPT 49 DATA ORGANIZATION SHEET 1 of 2

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION				NO. of RUNS	REYNOLDS NUMBERS x 10 ⁻⁶ Per Foot							
		a	b	δ_{L1}	δ_{ER}	δ_{FB}	Γ		2.4	5.0	8.0	10.0	12.0	14.0		
RL7001	WBV	A	0	0	0	0	0	6	11	12	13	14	15	16		
002	↓			-10	-10			1					17			
003				-20	-20			1					18			
004	↓			-30	-30			1					19			
005	WBV		↓	-10	-30			1					20			
006	WB		0	0	0			1					21			
007	WB		-5					1					22			
008	WBV		↓					1					23			
009	B		↓					1					24			
010	EV		-5					1					25			
011	EV		0					1					26			
012	B		0					1					27			
013	WB		5				↓	1					101			
014	WBV1						0	1					102			
015							30	1					103			
016							60	1					104			
017				↓	↓		90	1					105			
018				0	0		110	1					106			
019	↓		5	-30	-30	↓	0	1					107			
020	WBV1	A	0	-30	-30	0	0	1					108			

* A, -6, -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

BETA 1 Q(PSF) 1 CN 1 CA 1 CLM 1 CY 1 CYN 1 CBL 1 RN/L 1 ALPHA 1
 COEFFICIENTS: 1 IDPVAR(1) 1 IDPVAR(2) 1
 SCHEDULES

UNIQUE CONFIGS. ORBITER
LARC
DR#1018 B-1- 867

UNIQUE CONFIG. ORBITER
LARC
DR#1018 8-1-868

TEST : LPT 49 DATA ORGANIZATION SHEET 2 of 2

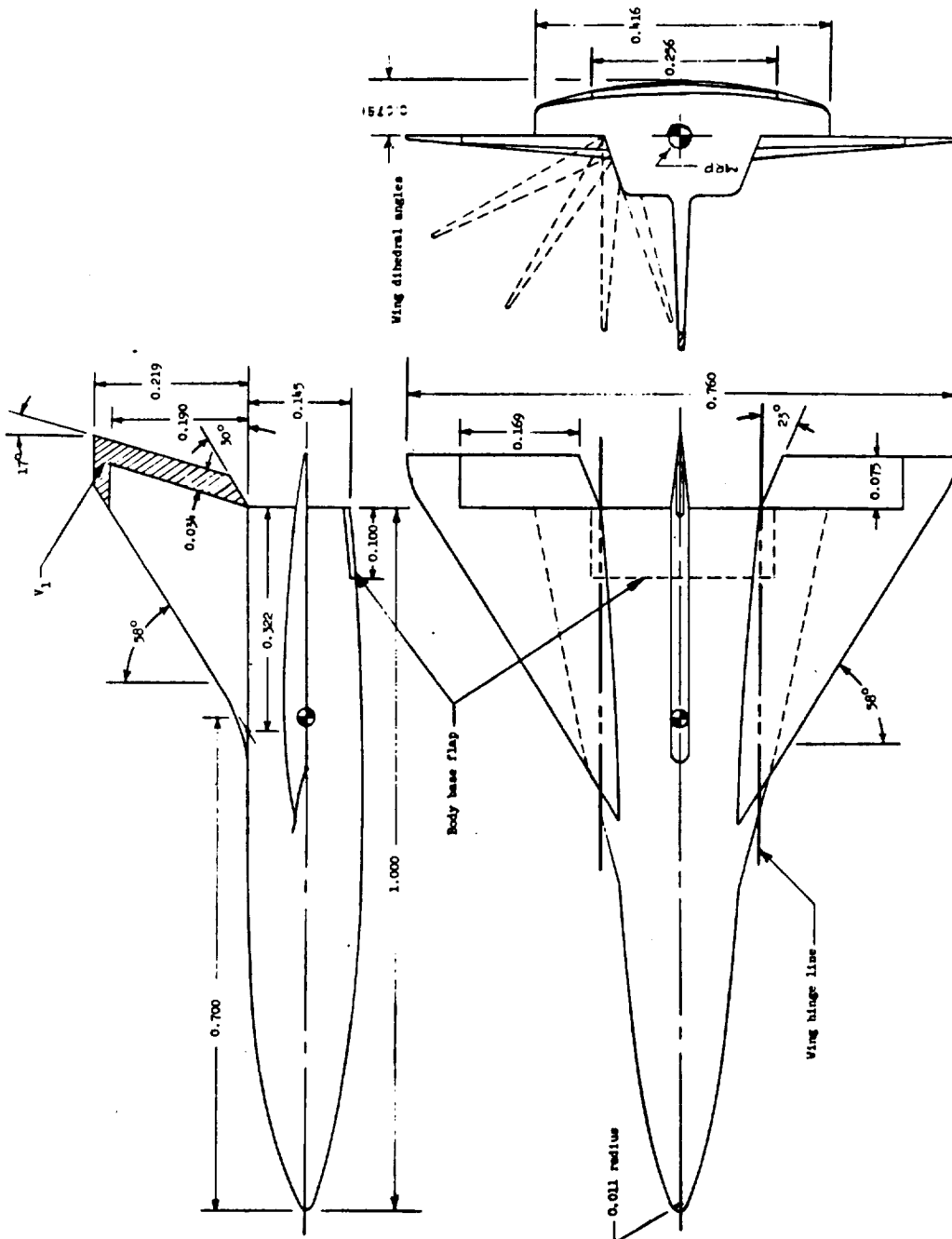
ORIGINAL PAGE IS
OF POOR QUALITY

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		CONTROL DEFLECTION			NO. of RUNS	RETINOLDS NUMBERS x 10 ⁻⁶ Per Foot						
		a	b	δ _{EL}	δ _{CR}	δ _{FB}		2.4	5.0	8.0	10.0	12.0	14.0	
RL7021	WBV1	A	0	0	0	0	1					109		
022						30	1					110		
023						60	1					111		
024						90	1					112		
025						110	1					113		
026						0	1					114		
027						-5	1					115		
028						-10	1					116		
029						-15	1					117		
030						-10	1					118		
031						-30	1					119		
032	WBV1	A	0	-10	-30	-15	1					120		

A -6, -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

a or b
SCHEDULES

ORIGINAL PAGE IS
OF POOR QUALITY



UNIQUE CONFIG. ORBITER
LARC
DR#1018 B-1- 869

Figure 1.- Sketch of model used in investigation. All dimensions are normalized with respect to body length. Body length = 20.5 inches.

ORIGINAL PAGE IS
OF POOR QUALITY

Table 1
TEST DATA SUMMARY SHEETS

TEST TITLE: MDAC-DWO Flow Field Tests

TEST NUMBER: VT1162

TEST FACILITY: AEDC-Tunnel B

TEST DATE: May, September 1971

TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Wake-Support	Re/ft x 10 ⁻⁶	Data Type*	Model Position (degrees)			Flow Field Survey Station X/L
									α	β	γ	
13	MDAC-DWO	0.011	8.0	860	1340	1	3.7	SP	10	0	180	---
12									20			
11									30			
28									40			
29									50			
30									60			
27								FF	10			0.3
23												0.5
20												0.7
14												0.916
25									20			0.3
22												0.5
19												0.7

*SP - Surface Pressure
FF - Flow Field

DELTA WING ORBITER
MDAC
DR#1225 B-2-1

Table 1 - Concluded
TEST DATA SUMMARY SHEETS

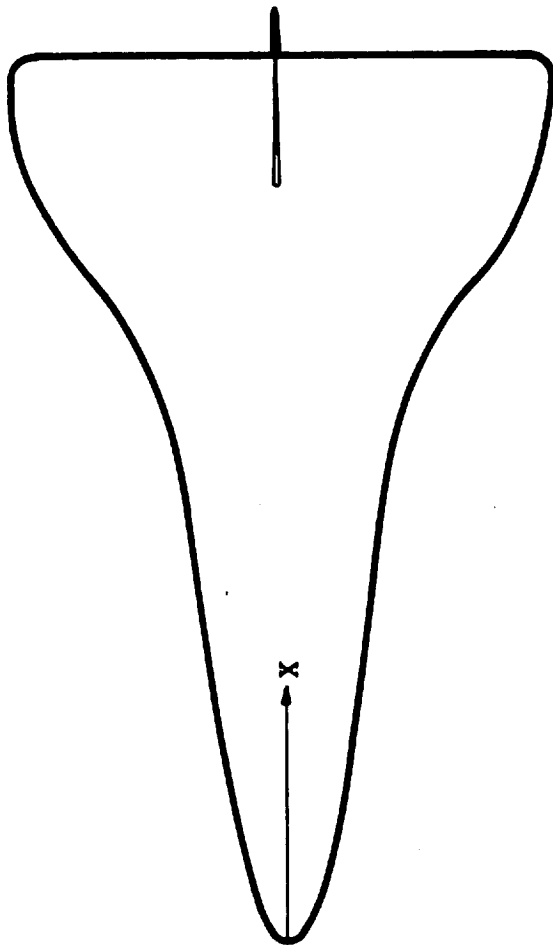
TEST TITLE: MDAC-DW0 Flow Field Tests

TEST NUMBER: VT1162 TEST FACILITY: AEDC-Tunnel B

TEST DATE: May, September 1971 TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Rake-Support	Re/ft x 10 ⁻⁶	Data Type*	Model Position (degrees)			Flow Field Survey Station X/L
									α	θ	ϕ	
15	MDAC-DW0	0.011	8.0	860	1340	1	3.7	FF	20	0	180	0.916
24									30			0.3
21												0.5
18												0.7
16												0.916
343						2			40			0.3
341						2						0.5
34						1						0.7
33												0.916
35												0.7
32									50			0.916
36												0.7
31									60			0.916

*SP - Surface Pressure
FF - Flow Field



Pressure Orifice	X/L
1	0.1
2	0.2
3	0.3
4	0.4
5	0.5
6	0.6
7	0.7
8	0.8
9	0.916
10	0.970

All Dimensions in Inches

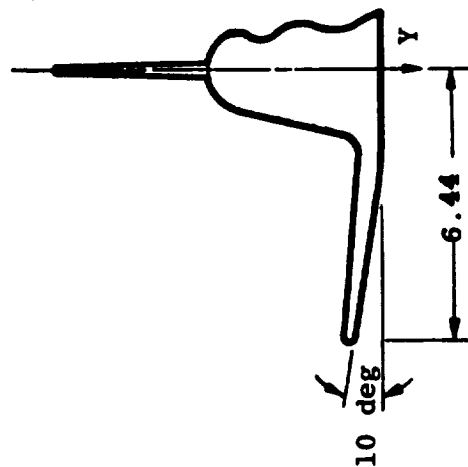
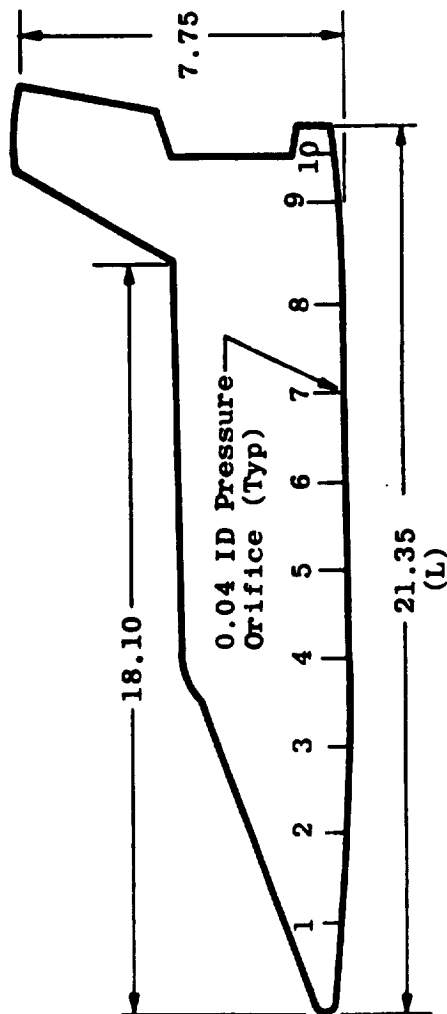


Fig. 1 McDonnell Douglas Delta Wing Orbiter Model Sketch (0.011 Scale)

DELTA WING ORBITER
MDAC
DR#1225 B-2- 3

ORIGINAL PAGE IS
OF POOR QUALITY

No.	PROBE HEIGHT, Y, IN.			
	Pressure Probes		Temperature Probes	
	Rake No. 1	Rake No. 2	Rake No. 1	Rake No. 2
1	0.014	0.014	0.046	0.051
2	0.065	0.066	0.151	0.131
3	0.111	0.112	0.226	0.202
4	0.158	0.163	0.324	0.303
5	0.207	0.216	0.426	0.402
6	0.254	0.258	0.629	0.599
7	0.308	0.313		
8	0.363	0.365		
9	0.414	0.415		
10	0.501	0.499		
11	0.598	0.606		
12	0.701	0.702		
13	0.807	0.802		
14	0.899	0.892		
15	1.000	0.981		

All Dimensions in Inches.

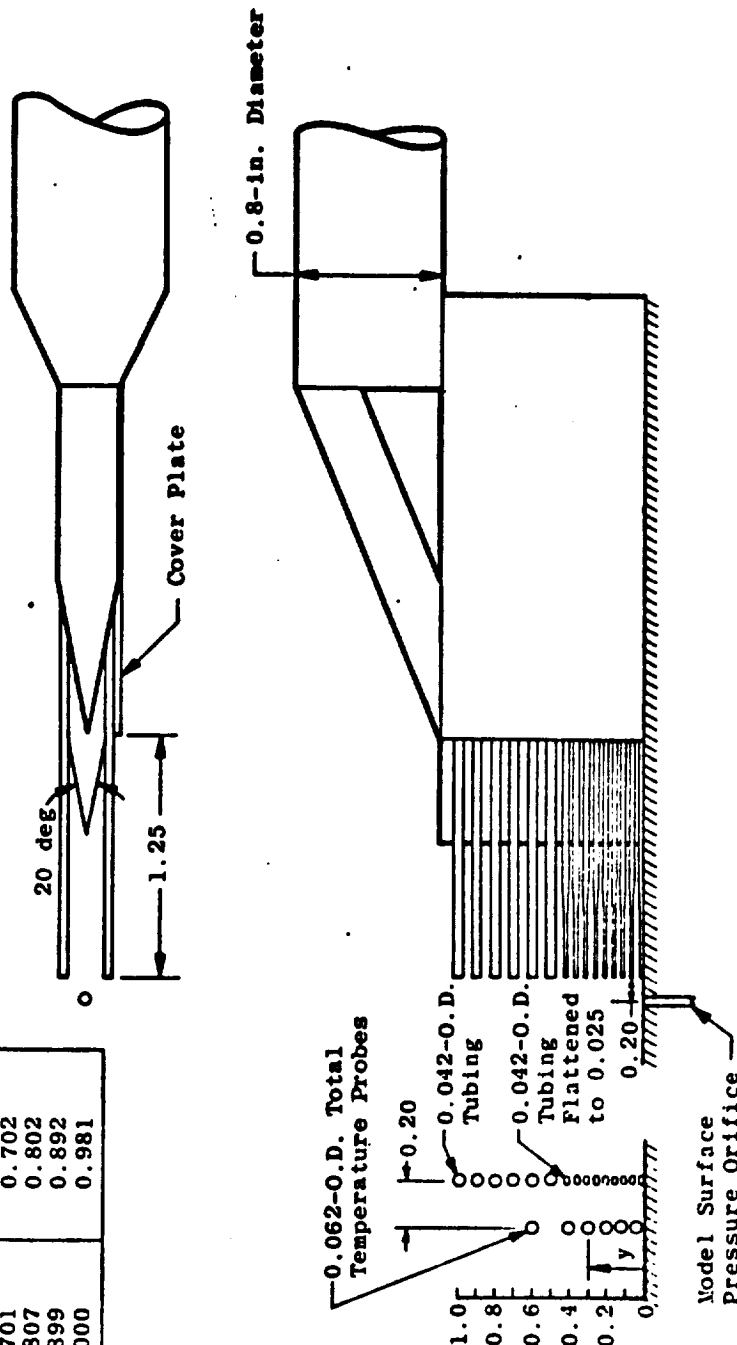


Fig. 3 Probe-Rakes and Support

TABLE 2.

TEST DATA SUMMARY SHEETS

TEST TITLE: HAR-DWO Flow Field Tests

TEST NUMBER: VT1162

TEST FACILITY: AEDC Tunnel B

TEST DATE: September 1971

TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Re/ft $\times 10^{-6}$	Flow Field Survey Station X/L	Type Data*	Model Position (degrees)			Remarks
									α	β	ϕ	
320	NAR-DWO	0.013	8.0	860	1340	3.7	N/A	SP	10	0	180	
321									20			
322									30			
323									40			
324									50			
316							0.3	FF	10			
312							0.5					
308							0.7					
303							0.9					
317							0.3		20			
315							0.5					
309							0.7					
306							0.9					

*SP - Surface Pressure
FF - Flow FieldDELTA WING ORBITER
NR
DR#1225 B-2- 5

TEST DATA SUMMARY SHEETS

TEST TITLE: NAR-DW0 Flow Field Tests

TEST NUMBER: VT1162

TEST FACILITY: AEDC Tunnel B

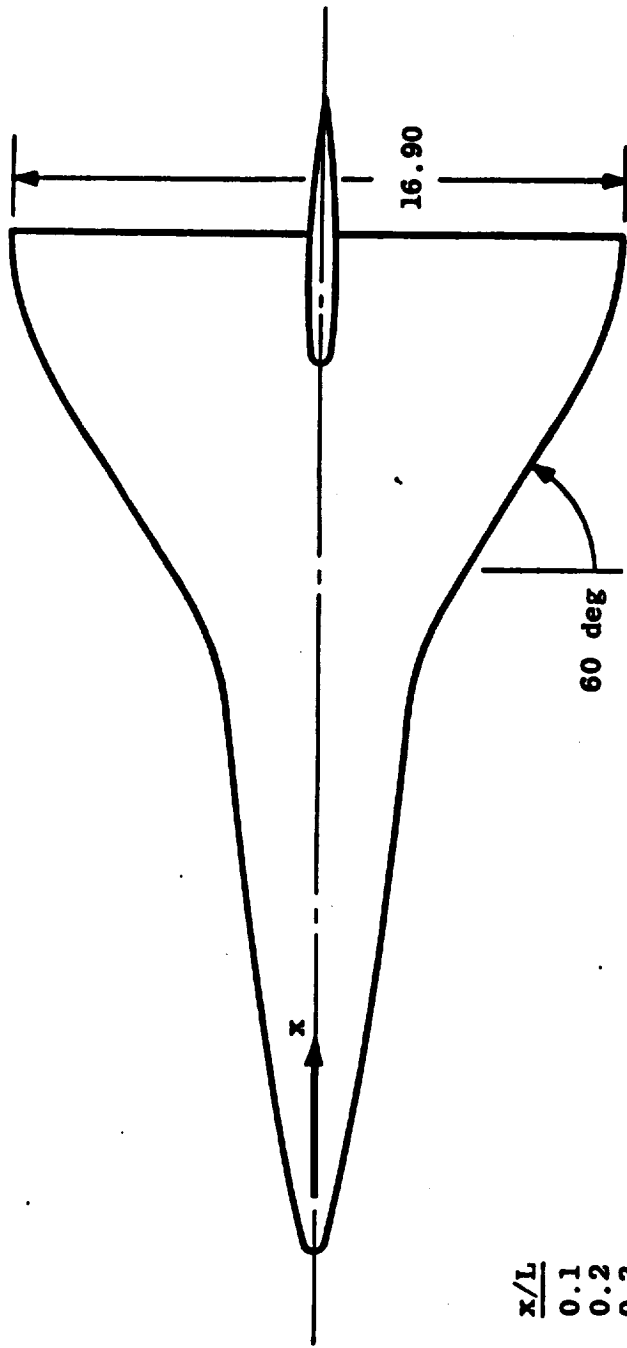
TEST DATE: September 1971

TEST ENGINEER:
R. K. Matthews & W. R. Martindale

ORIGINAL PAGE IS
OF POOR QUALITY

[illegible]

*SP - Surface Pressure
PP - Flow Field



Pressure Orifice	x/L
1	0.1
2	0.2
3	0.3
4	0.4
5	0.5
6	0.6
7	0.7
8	0.8
9	0.9
10	0.97

All Dimensions in Inches
Model Scale ~ 0.013

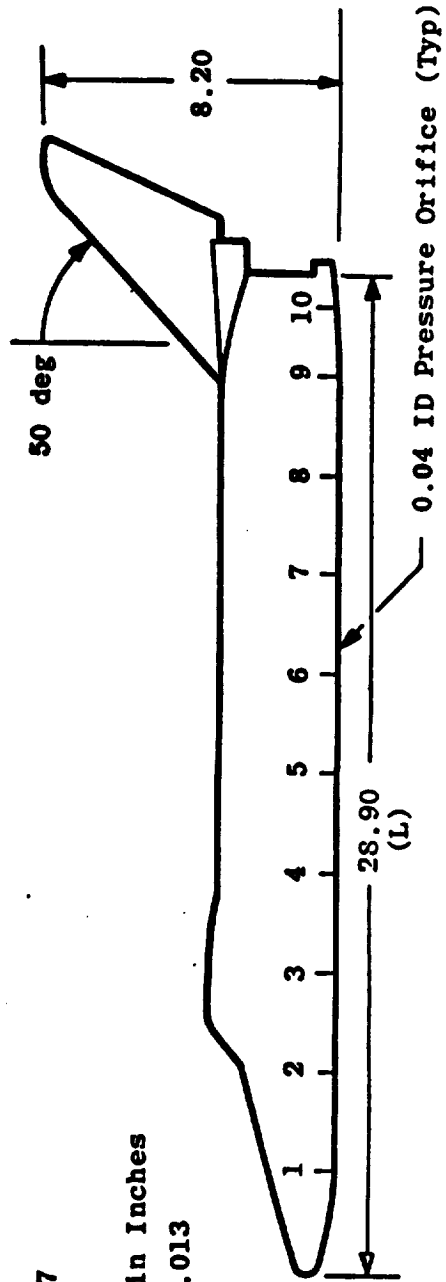


Fig. 1 North American Rockwell Delta Wing Orbiter Model Sketch (0.013 Scale DELTA WING ORBITER

NR

DR#1225 8-2-7

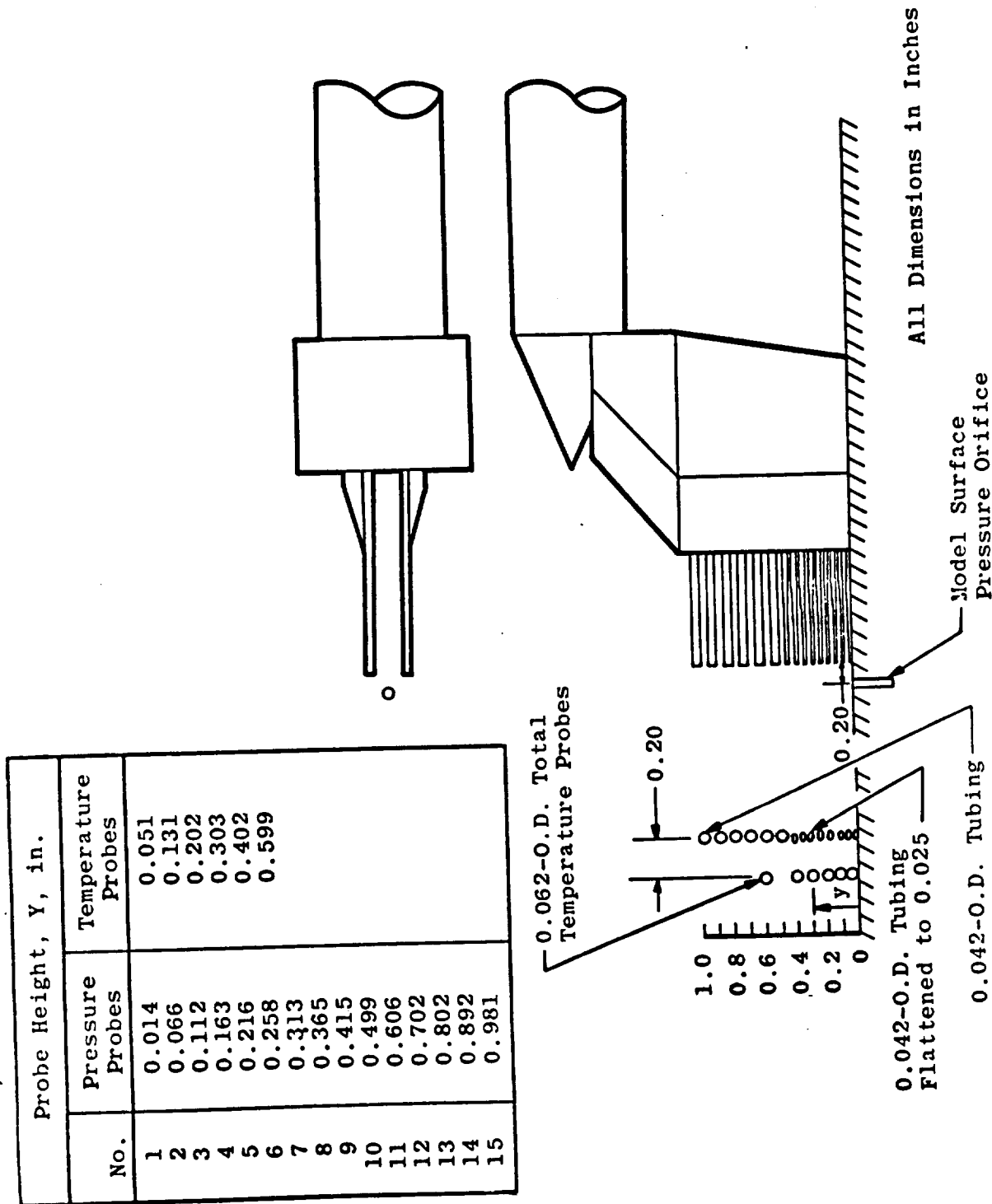


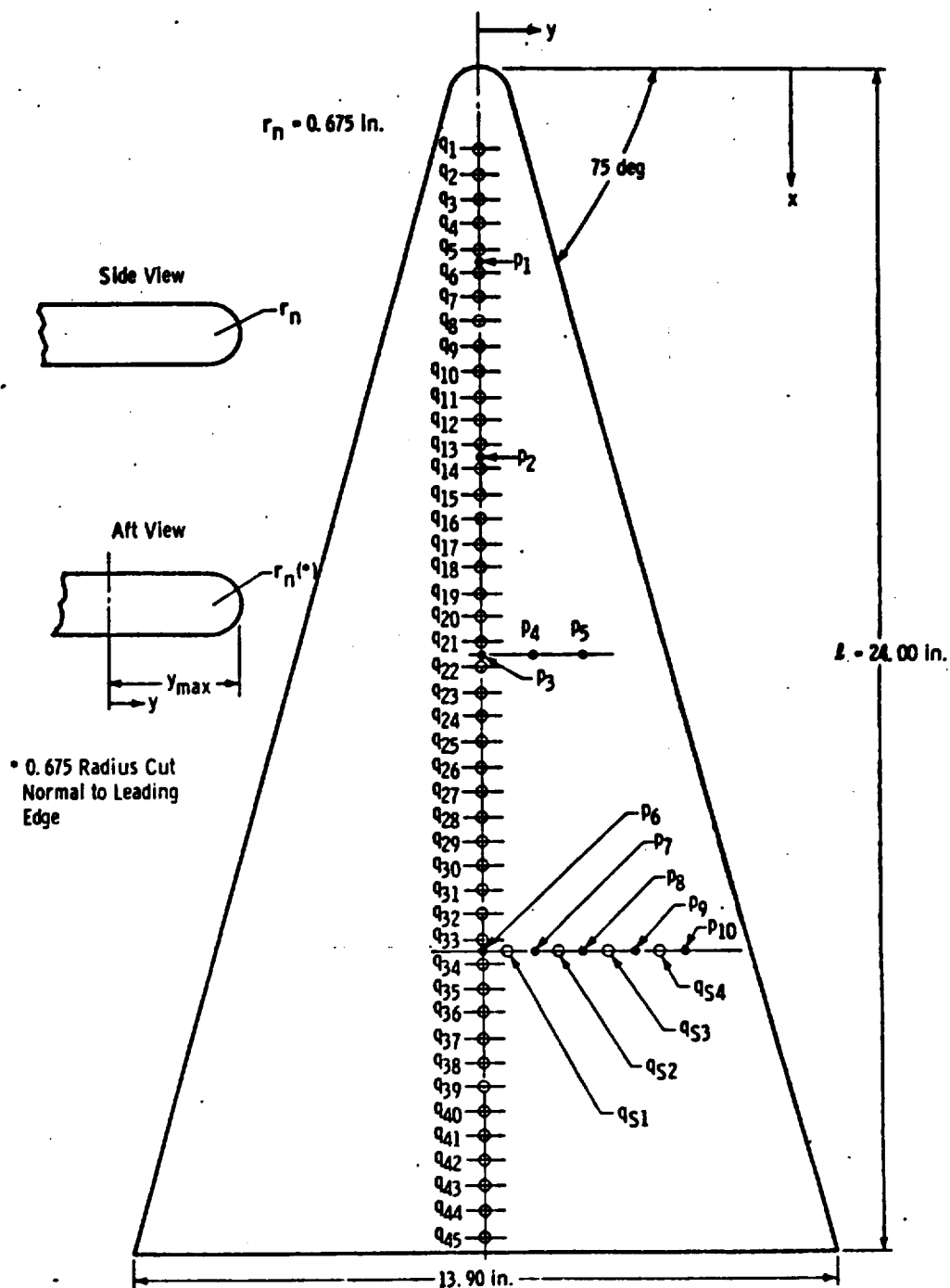
Fig. 3 Probe-Rakes and Support

TABLE II
TEST SUMMARY FOR THE TUNNEL F LANGLEY MODELS

<u>Model</u>	<u>α, Deg.</u>	<u>Run</u>	<u>$\sim M_\infty$</u>	<u>$\sim Re_{\infty, l}$</u>	<u>Phosphor Paint Area</u>	<u>Final Paint Picture</u>
LRC-DB	20.0	3631	10.4	$7-13 \times 10^6$	2	Yes
	20.0	3632	10.5	$7-21 \times 10^6$	1	No
	20.0	3633	10.4	$7-15 \times 10^6$	3	↓
	40.2	3634	10.4	$6-14 \times 10^6$	2	
	40.5	3635	10.4	$5-22 \times 10^6$	1	
	61.0	3636	10.8	$9-22 \times 10^6$	1	
	60.2	3637	10.4	$5-9 \times 10^6$	1	
	61.0	3638	10.6	9×10^6	3	
	60.5	3639	10.6	$10-20 \times 10^6$	2	
LRC-SB	20.2	3646	10.6	$10-18 \times 10^6$	2	No
	20.2	3647	10.3	$6-18 \times 10^6$	↓	Yes
	40.2	3641	10.7	$7-16 \times 10^6$		Yes
	40.2	3645	10.6	$11-23 \times 10^6$		Yes
	60.2	3642	10.6	$5-10 \times 10^6$		No
	60.2	3648	10.6	$10-20 \times 10^6$		Yes
	60.5	3649	10.5	$6-17 \times 10^6$	↓	No

Phosphor Paint Legend:

- 1 - Aft patches off centerline
- 2 - Entire lower surface
- 3 - Non-instrumented half



a. LRC-DB Model, Configuration 9

Fig. 3 Instrumentation Layout for the Tunnel F Langley Models

TABLE 1.

THIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET

TEST TITLE: SPACE SHUTTLE ORBITER WITH EXTERNAL TANKS HEAT TRANSFER MODEL TEST

TEST NUMBER: 66 TEST FACILITY: NASA/LRC 31-INCH-CFHT

TEST DATE: APRIL 19-23, 1971 TEST ENGINEER: A. D'errico, R. Romanowski

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNX10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
1	W ₁ B ₃ V _{1H} T ₂ ¹	.0067	10.35	753	1826	1.0	0.96	N/A	0	0	0			
2	W ₁ B ₃ V _{1H} T ₂ ¹			751	1882		0.90		5					
3	W ₁ B ₃ V _{1H} T ₂ ²			754	1813		0.98		0					
4	W ₁ B ₃ V _{1H} T ₂ ²			754	1829		0.96		5					
5	W ₁ B ₃ V _{1H} T ₄ ¹			752	1825		0.96		0					
6	W ₁ B ₃ V _{1H} T ₄ ¹			752	1842		0.94		5					
8	W ₁ B ₃ V _{1H} T ₄ ²			755	1840		0.95		5					
9	W ₁ B ₃ V _{1H} T ₄ ²			755	1828		0.96		0					
10	W ₁ B ₃ V _{1H} T ₃ ¹			756	1829		0.96		0					
11	W ₁ B ₃ V _{1H} T ₃ ¹			755	1832		0.96		5					
12	W ₁ B ₃ V _{1H}			756	1815		0.98		0					
13	W ₁ B ₃ V _{1H}			756	1823		0.97		5					
14	W ₁ B ₃ V _{1H} T ₂ ³			754	1827		0.96		0					

* Taw : adiabatic wall temperature

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

DELTA WING ORBITER
GAC
DR#1146 B-3-3

982

ORIGINAL PAGE IS
OF POOR QUALITY

WITHIN SKIN THERMOCOUPLE TEST DATA SUMMARY SHEET

TEST TITLE: SPACE SHUTTLE ORBITER WITH EXTERNAL TANKS HEAT TRANSFER MODEL TEST

TEST NUMBER: 66 TEST FACILITY: NASA/LRC 31-INCH-CFRT

TEST DATE: APRIL 19-23, 1971 TEST ENGINEER: A. D'errico, R. Romanowski

[illegible]

*** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, - left, as viewed from the rear)
Z axis (+up, -down)

TABLE 2.

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: SPACE SHUTTLE ORBITER WITH EXTERNAL TANKS HEAT TRANSFER MODEL TEST

TEST NUMBER: 66 TEST FACILITY: NASA/IRC 31-INCH-CFHT

TEST DATE: April, 19-23, 1971 TEST ENGINEER: A. D'errico, R. Romanowski

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	$\frac{T_{aw}}{T_{total}}$	$\frac{RNX}{10^6}$ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	θ	ϕ	X	Y	Z
16	W ₁ B ₃ V _{1H} T ₂ ¹	.0067	10.35	750	1820	1.0	0.93	200	0	0	0			
17	W ₁ B ₃ V _{1H} T ₂ ¹			750	1830		0.92	450						
18	W ₁ B ₃ V _{1H} T ₂ ¹			735	1810		0.92	325						
19	W ₁ B ₃ V _{1H} T ₂ ²			755	1750		1.00	200						
20	W ₁ B ₃ V _{1H} T ₃ ¹			750	1780		0.97	200						
21	W ₁ B ₃ V _{1H} T ₃ ¹			750	1820		0.93	150						
22	W ₁ B ₃ V _{1H} T ₃ ¹			750	1820		0.93	250						
23	W ₁ B ₃ V _{1H} T ₄ ²			750	1800		0.95	325						
24	W ₁ B ₃ V _{1H} T ₄ ²			755	1800		0.96	200						
25	W ₁ B ₃ V _{1H}			740	1760		0.98	125						

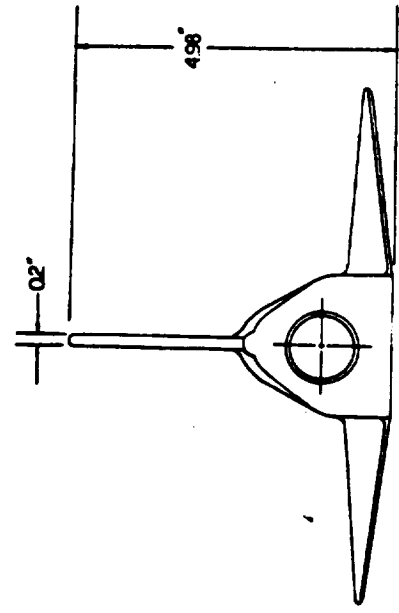
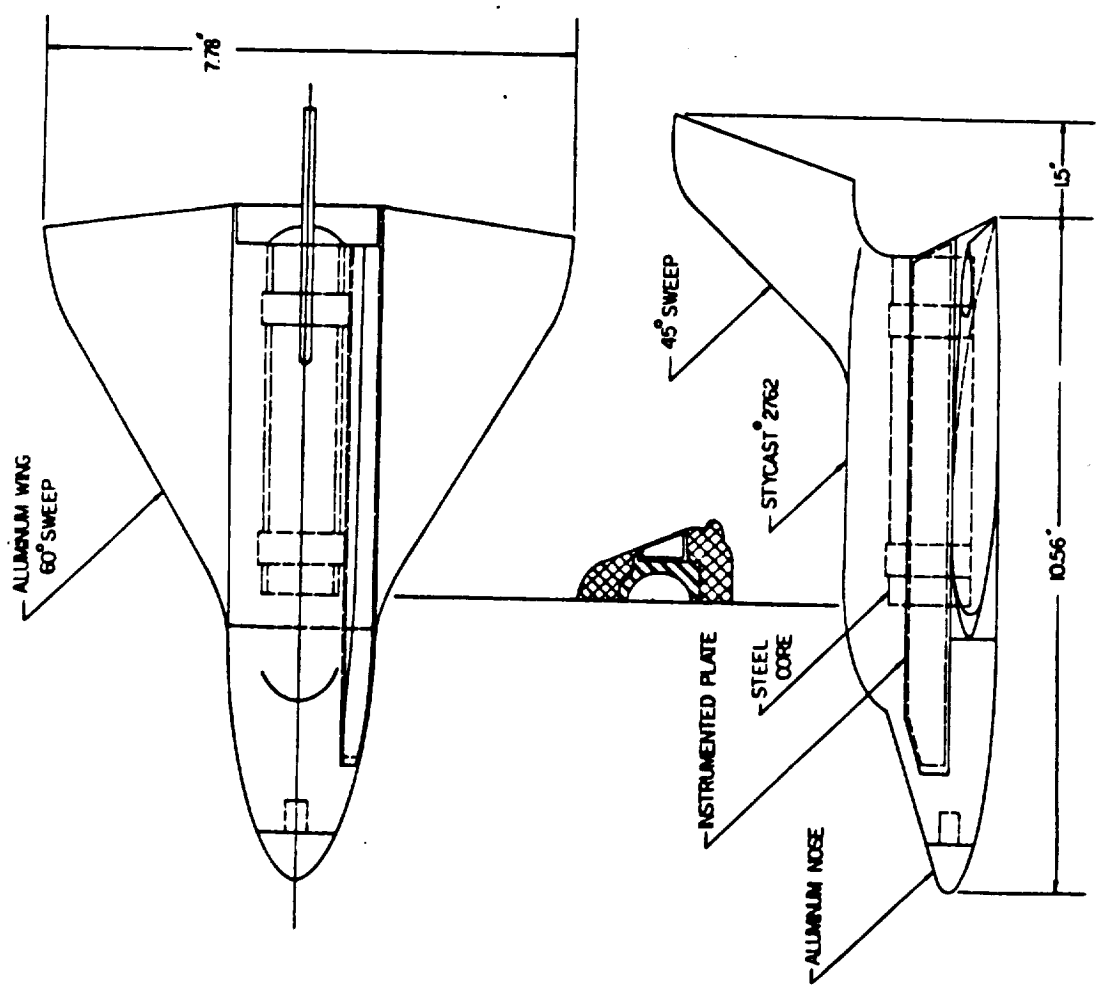
** X axis parallel to stream (+downstream, -upstream)

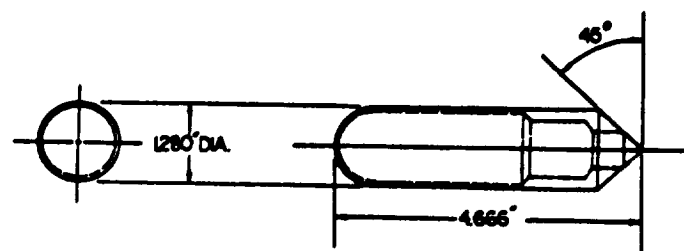
Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

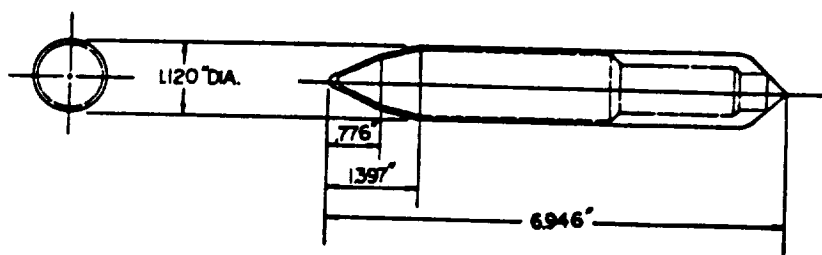
* T_{aw} : adiabatic wall temperature

FIGURE 1. SPACE SHUTTLE DELTA-WING ORBITER
 HEAT TRANSFER MODEL

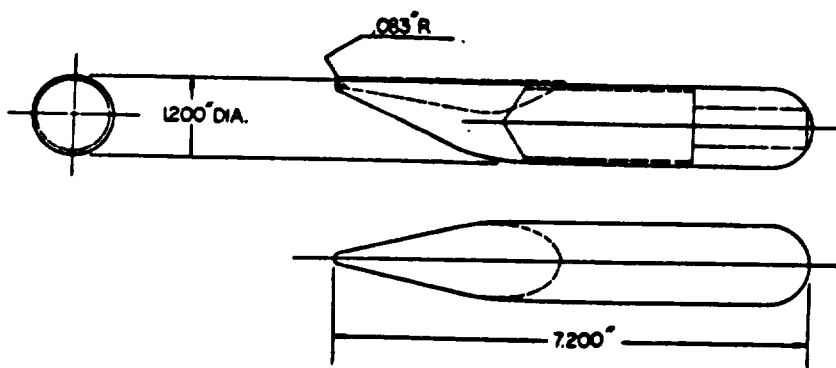




HEMISPHERICAL NOSE TANK



CONICAL NOSE TANK



CONTOURED NOSE TANK

FIGURE 2. EXTERNAL TANK MODELS

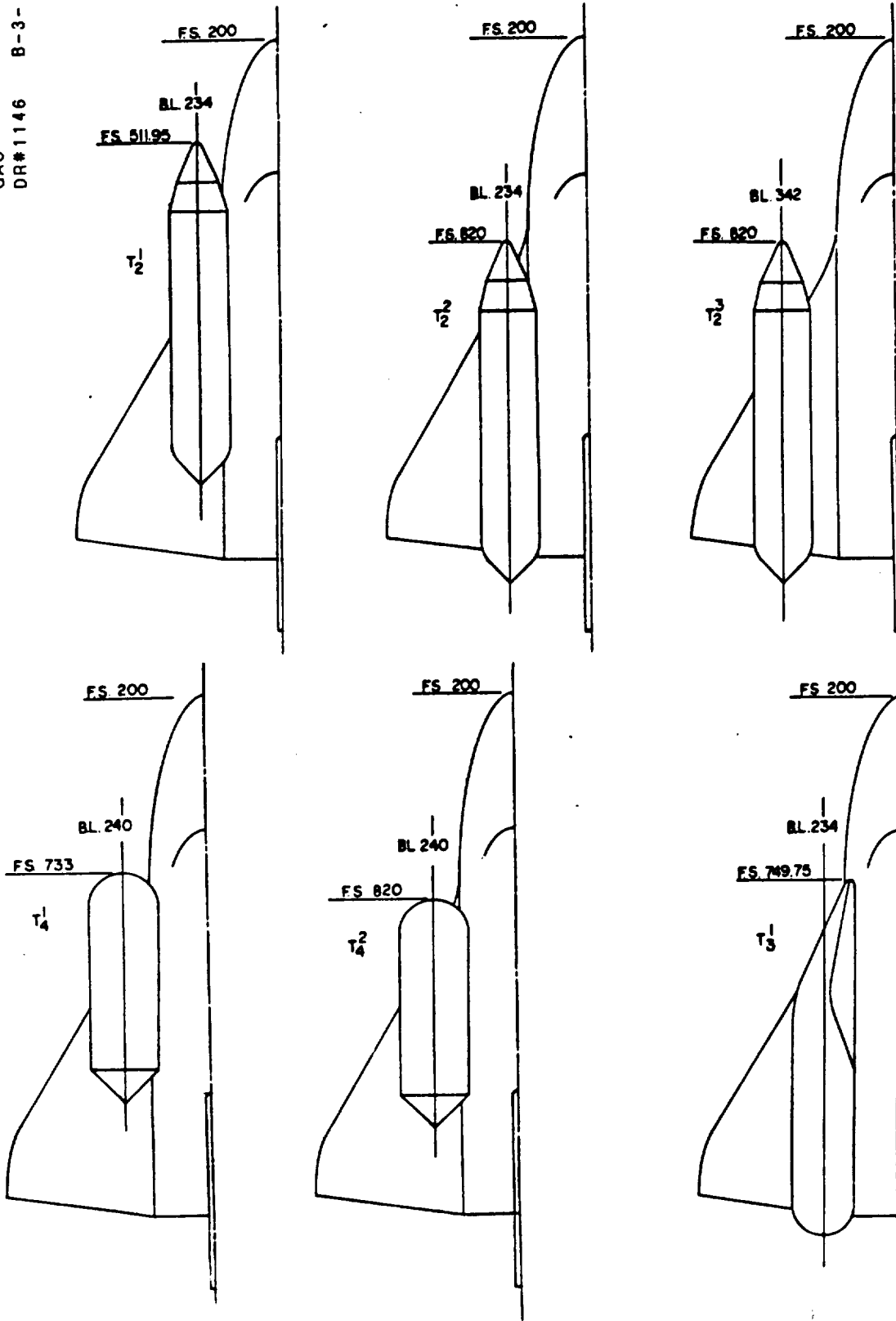
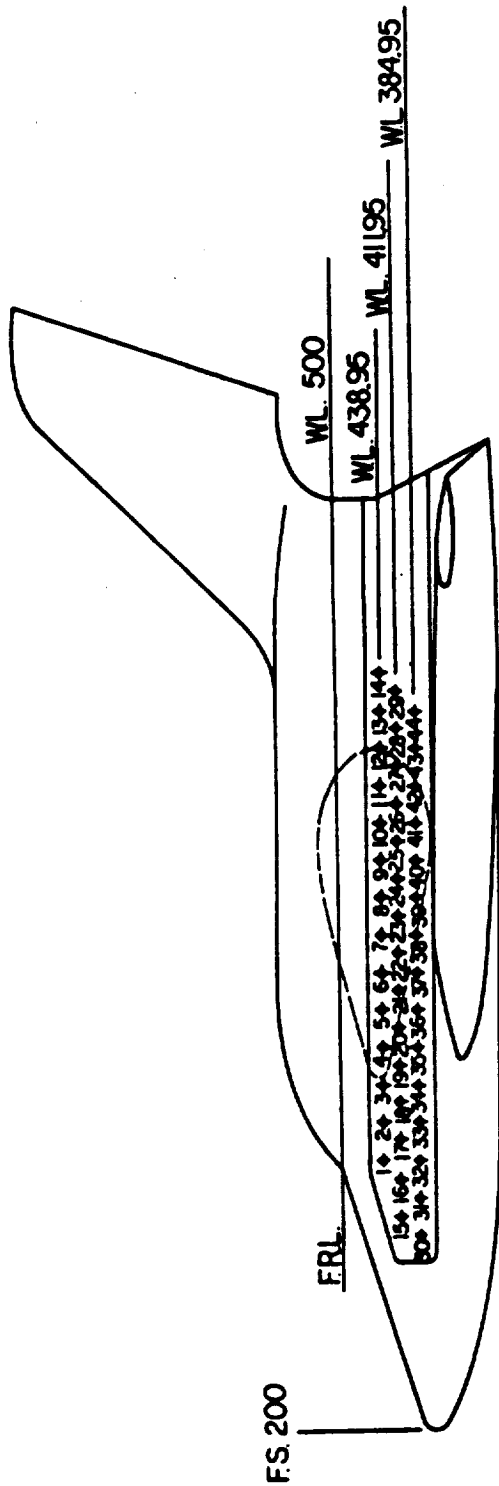


FIGURE 3. TANK LOCATIONS



- FOR THERMOCOUPLE COORDINATES, SEE TABLE 3.
- BROKEN LINE INDICATES AREA COVERED BY CONTOURED NOSE TANK FAIRING.

FIGURE 4. FUSELAGE THERMOCOUPLE LOCATIONS

DELTA WING ORBITER
GAC
DR#1146 B-3- 9

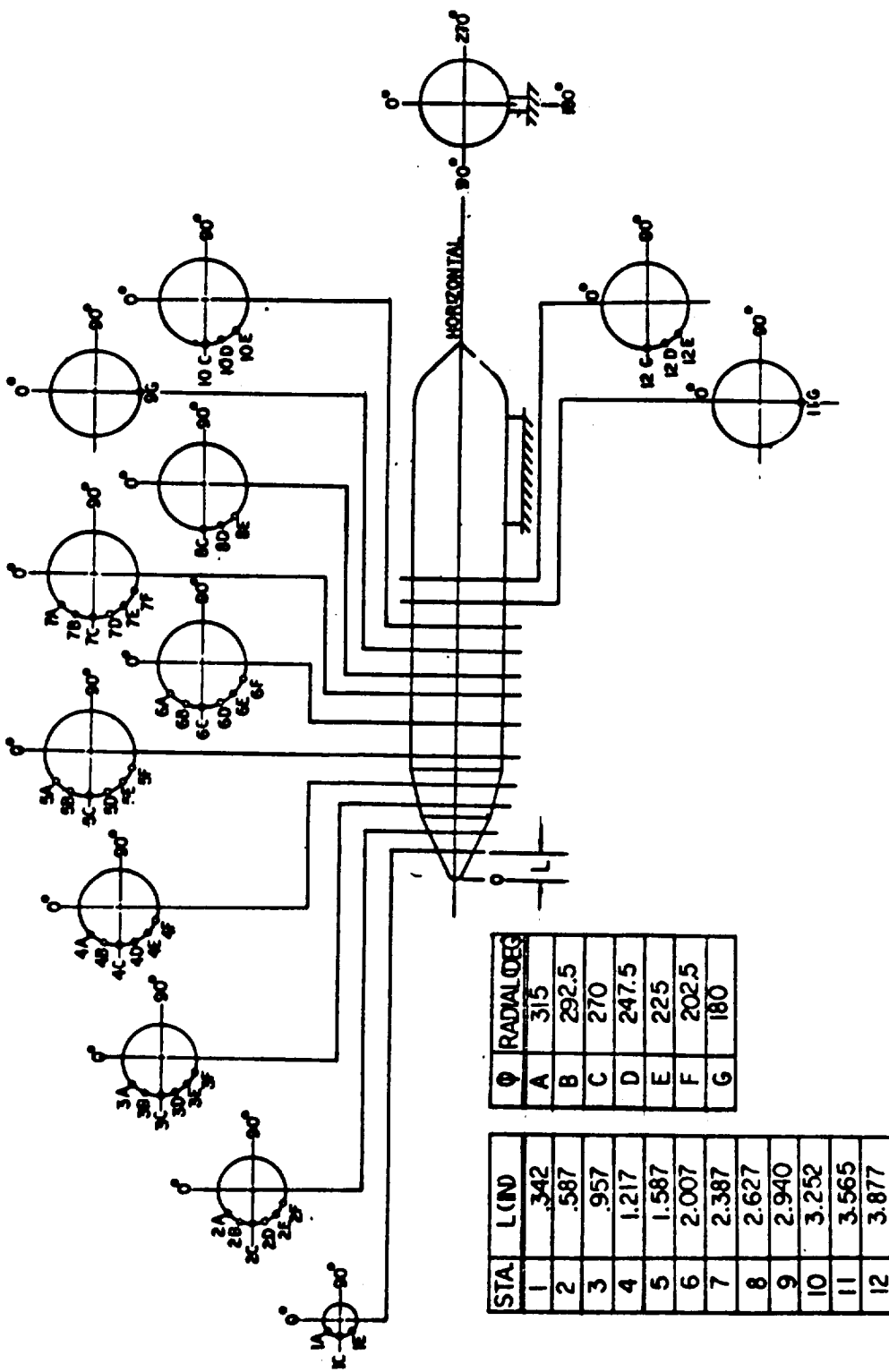
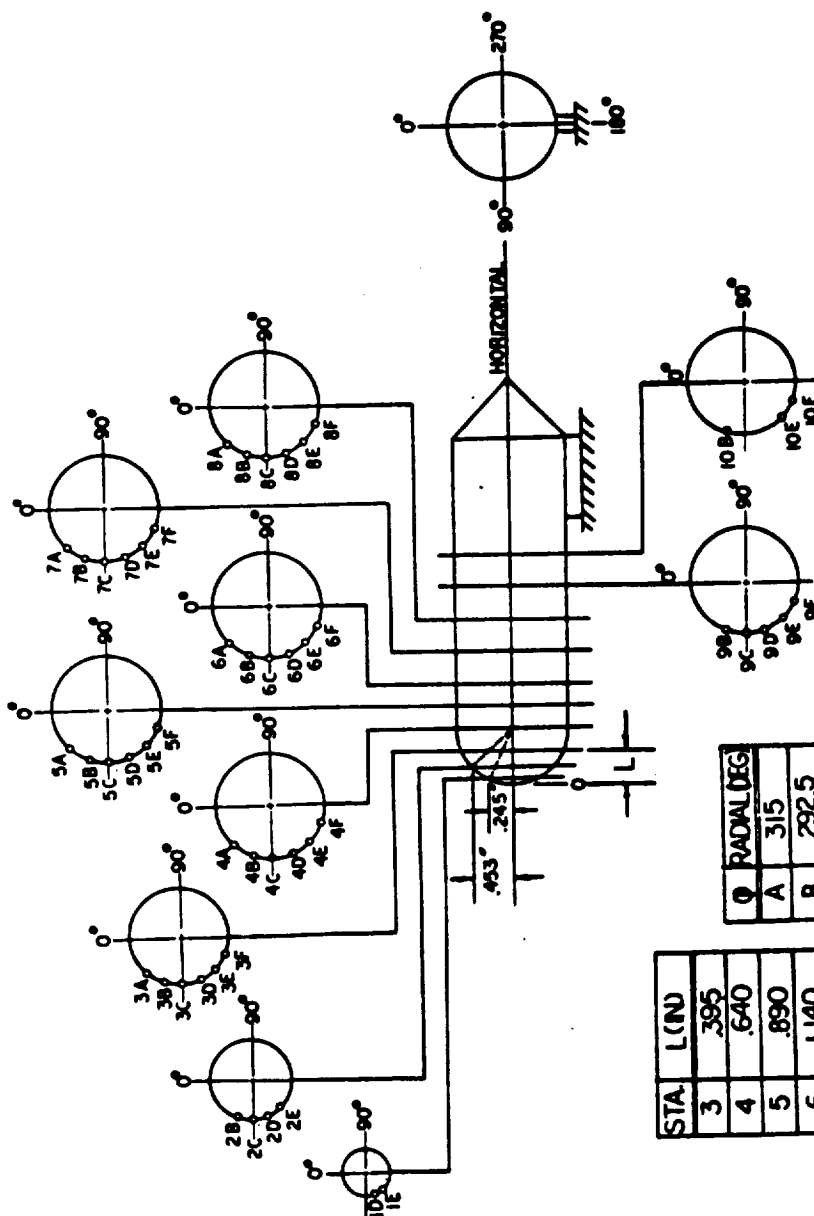


FIGURE 5. CONICAL NOSE TANK THERMOCOUPLE LOCATIONS



STA.	L (N)
3	.395
4	.640
5	.890
6	1.140
7	1.515
8	1.890
9	2.265
10	2.640

Ø	RADIAL DEG
A	315
B	292.5
C	270
D	247.5
E	225
F	202.5

FIGURE 6. HEMISPHERICAL NOSE TANK THERMOCOUPLE LOCATIONS

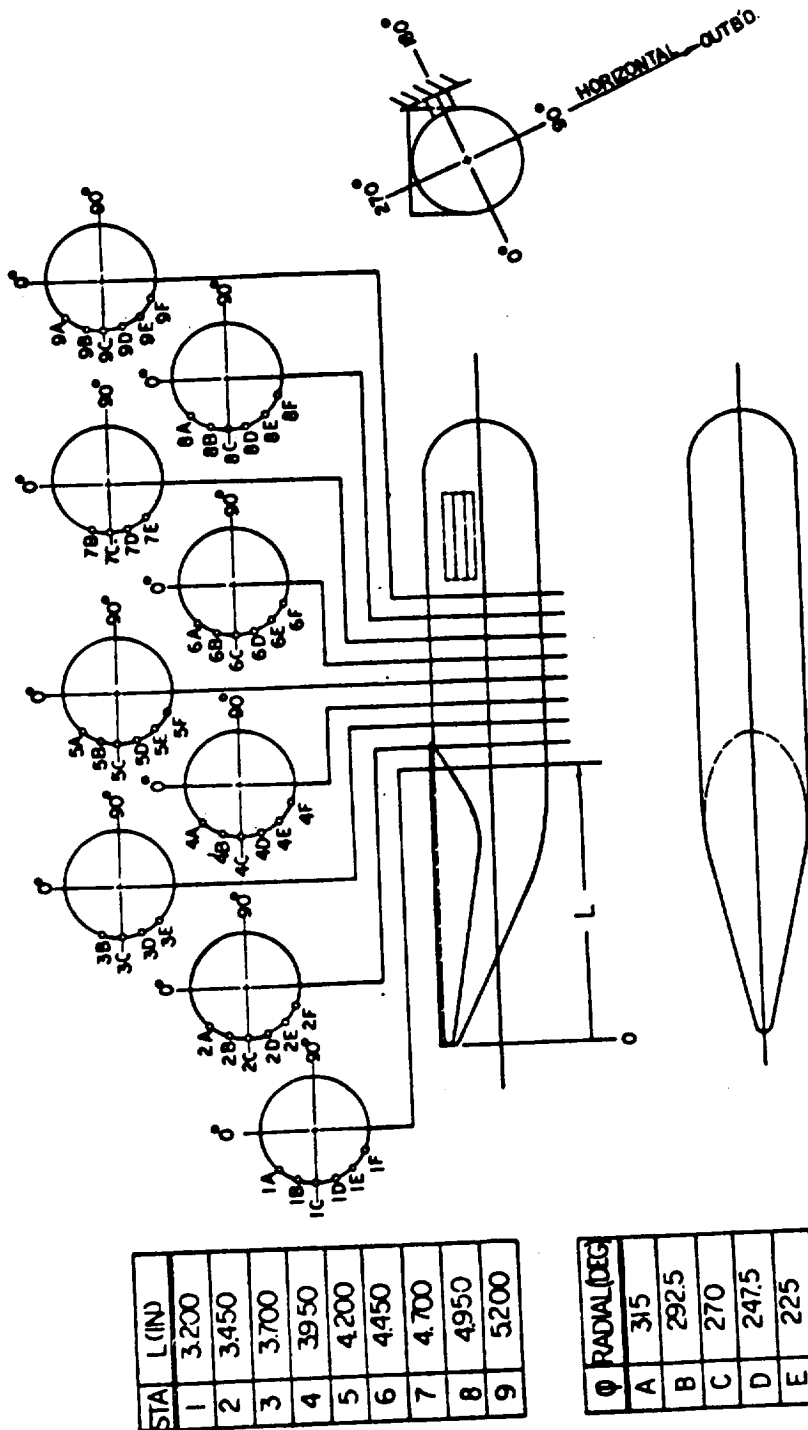
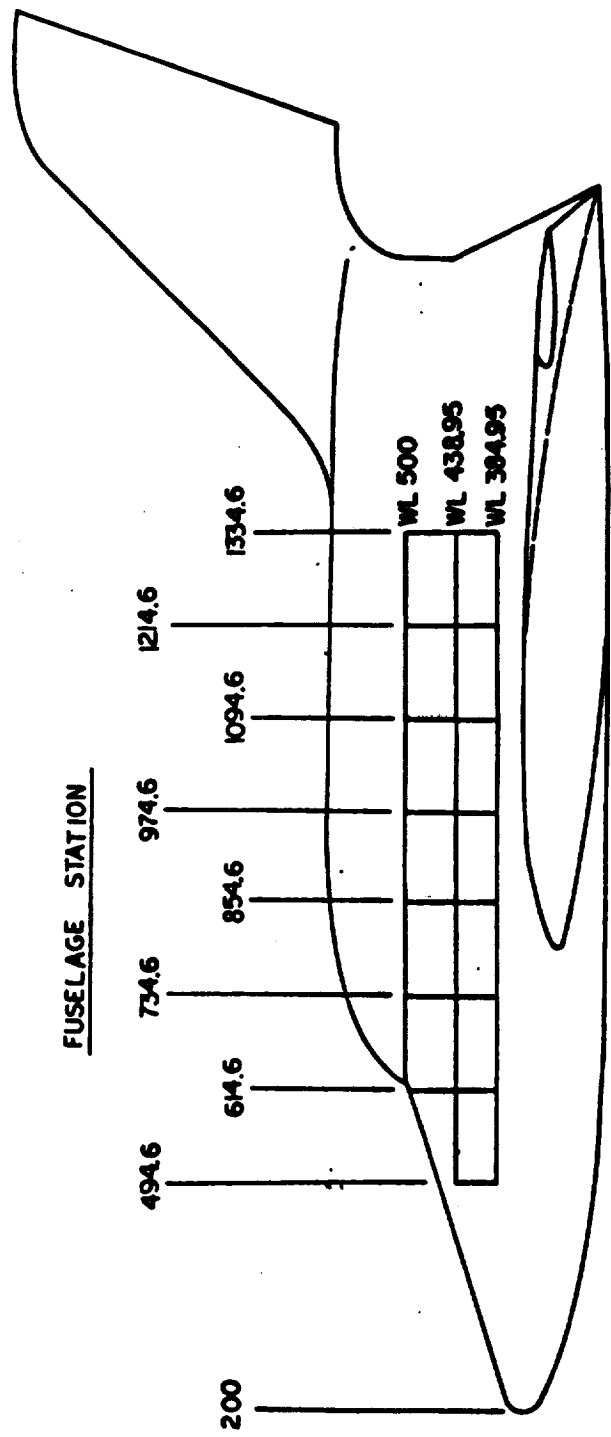


FIGURE 7. CONTOURED NOSE TANK THERMOCOUPLE LOCATIONS



59

FIGURE 56. SURFACE-PAINTED FUSELAGE GRID LINES

992

DELTA WING ORBITER
GAC
DR#1146 B-3- 13

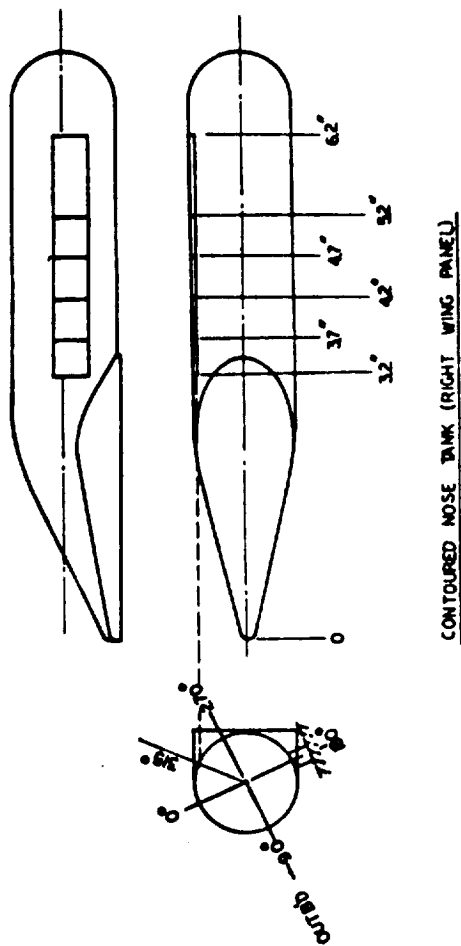
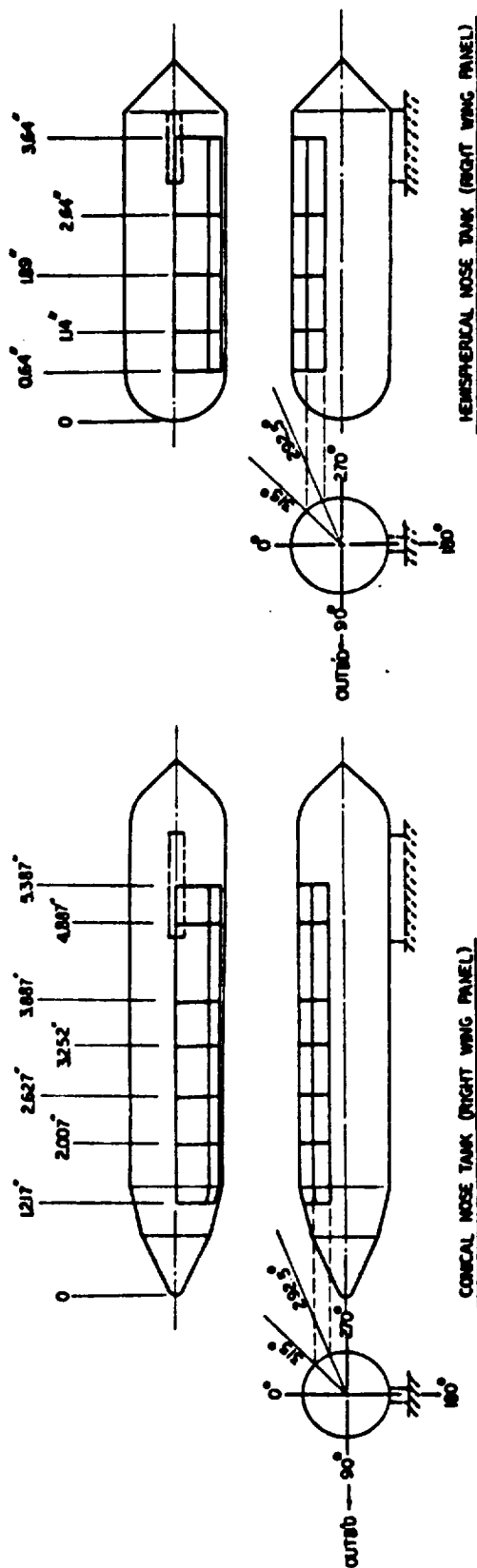


FIGURE 57. SURFACE PAINTED GRID LINES

TABLE 1

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: SPACE SHUTTLE ORBITER HEAT TRANSFER MODEL TEST

TEST NUMBER: GFET-017 TEST FACILITY: GAC HYPERSONIC TUNNEL

TEST DATE: FEBRUARY 20- MARCH 22, 1974 TEST ENGINEER: A. D'ERRICO

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} / T_{total}	$RNX10^6$ Ft	Phase Change Temp. (°F)	Model Position (degrees)	α	β	ϕ	$h_{r=1}$	T_w^{**}
2	$B_1^W V_{1H}$	.0067	8.0	123.0	1417	1.0	.47	200	0	0	0	0	.0301	535°R
5				123.2	1272		.57	200	20				.0297	
6				124.8	1405		.48	113	20				.0303	
7				123.6	1495		.43	200	30				.0304	
8				123.1	1259		.58	113	30				.0297	
9				125.9	1443		.47	113	0				.0306	
11				121.4	1435		.45	113	0			180	.0300	
14				123.7	1314		.54	113	20				.0299	
18				231.7	1560		.75	113	30				.0420	
19				237.5	1625		.72	200	50			0	.0427	
20				234.3	1617		.71	113	50				.0424	
21				227.9	1592		.74	113	50			180	.0416	
22	$B_2^W V_{2H}$			240.1	1604		.74	350	50			0	.0429	535°R

** T_w = wall temperature assumed in $h_{r=1}$ calculation* T_{aw} = adiabatic wall temperatureDELTA WING ORBITER
GAC
DR#1154 B-3- 15

994

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE 2

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: SPACE SHUTTLE ORBITER HEAT TRANSFER MODEL TEST

TEST NUMBER: QPHT-017 TEST FACILITY: GAC HYPERSONIC TUNNEL

TEST DATE: FEBRUARY 20-MARCH 22, 1971 TEST ENGINEER: A. D'Errico

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} / T_{total}	RNX10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)	$h_{T=1}$	T_w^{**}
									α	ϕ	
23	B ₂ W ₁ V ₂ H ₂	.0067	8.0	240.0	1560	1.0	.78	200	50	0	535°R
24				241.6	1606		.74	113	50		.0430
26				238.9	1614		.73	113	30		.0428
28				244.0	1531		.82	113	20		.0430
29				240.9	1579		.76	200	20		.0429
30				242.9	1615		.74	200	0		.0431
31				243.8	1707		.67	113	0		.0435
32	B ₁ W ₁ V ₁ H ₁			536.9	1525		1.82	113	20		.0641
66	B ₁ W ₁ V ₁ H ₁			239.4	1536		.80	113	20	0	.0426
67				239.5	1496		.84	200	20	0	.0424
68				243.1	1418		.93	200	0	0	.0425
69				239.0	1299		1.06	113	0	0	.0416
70				242.1	1452		.89	113	50	0	535°R

** T_w = wall temperature assumed in $h_{T=1}$ calculation

* T_{aw} = adiabatic wall temperature

FIGURE 1

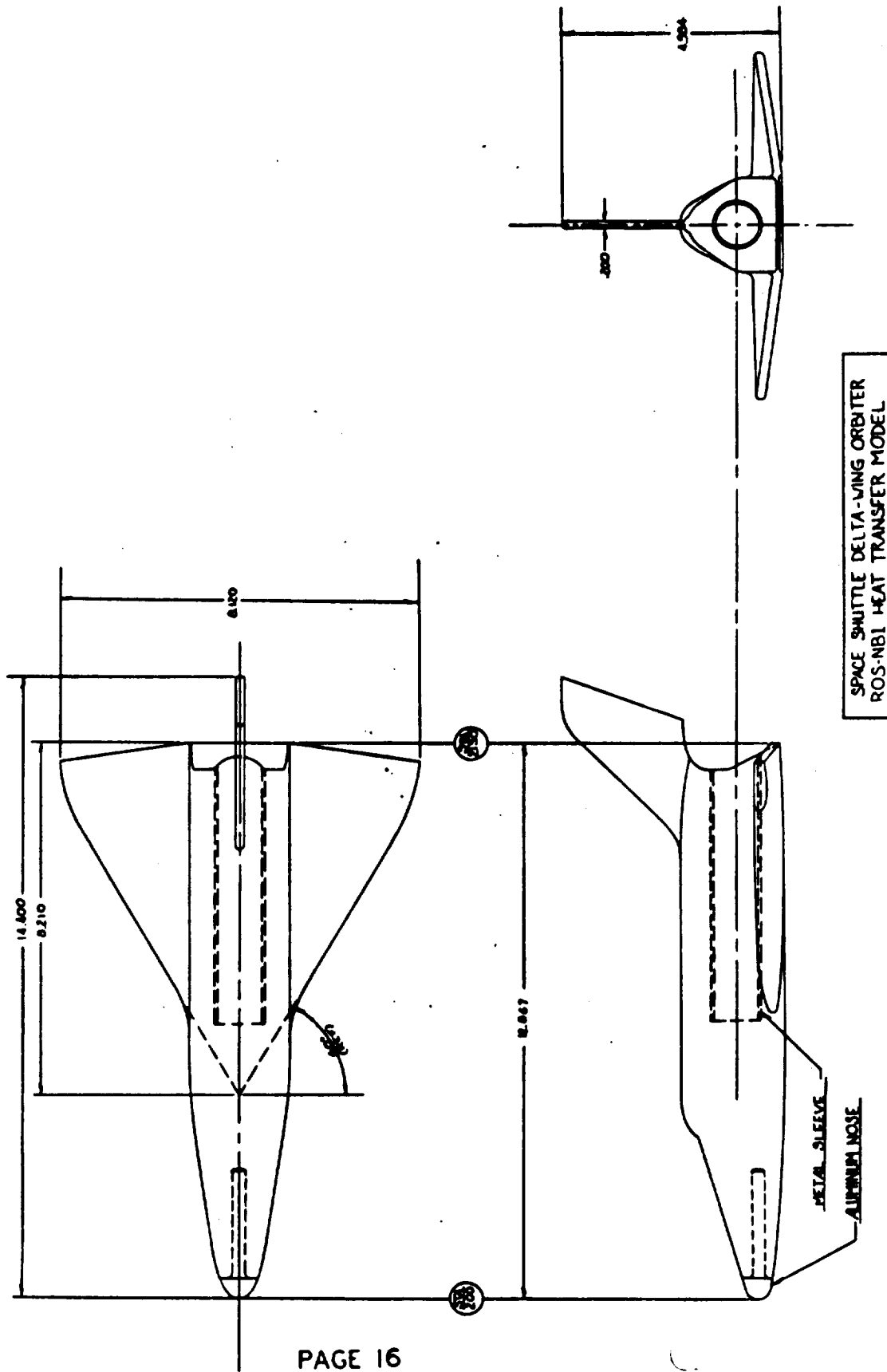
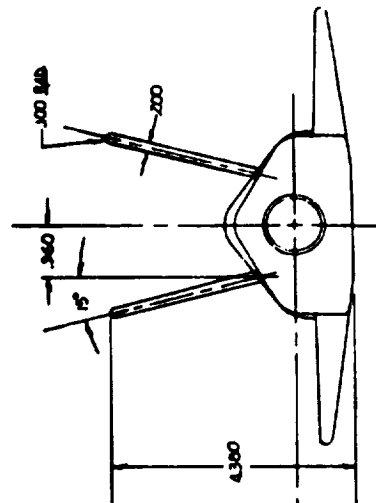
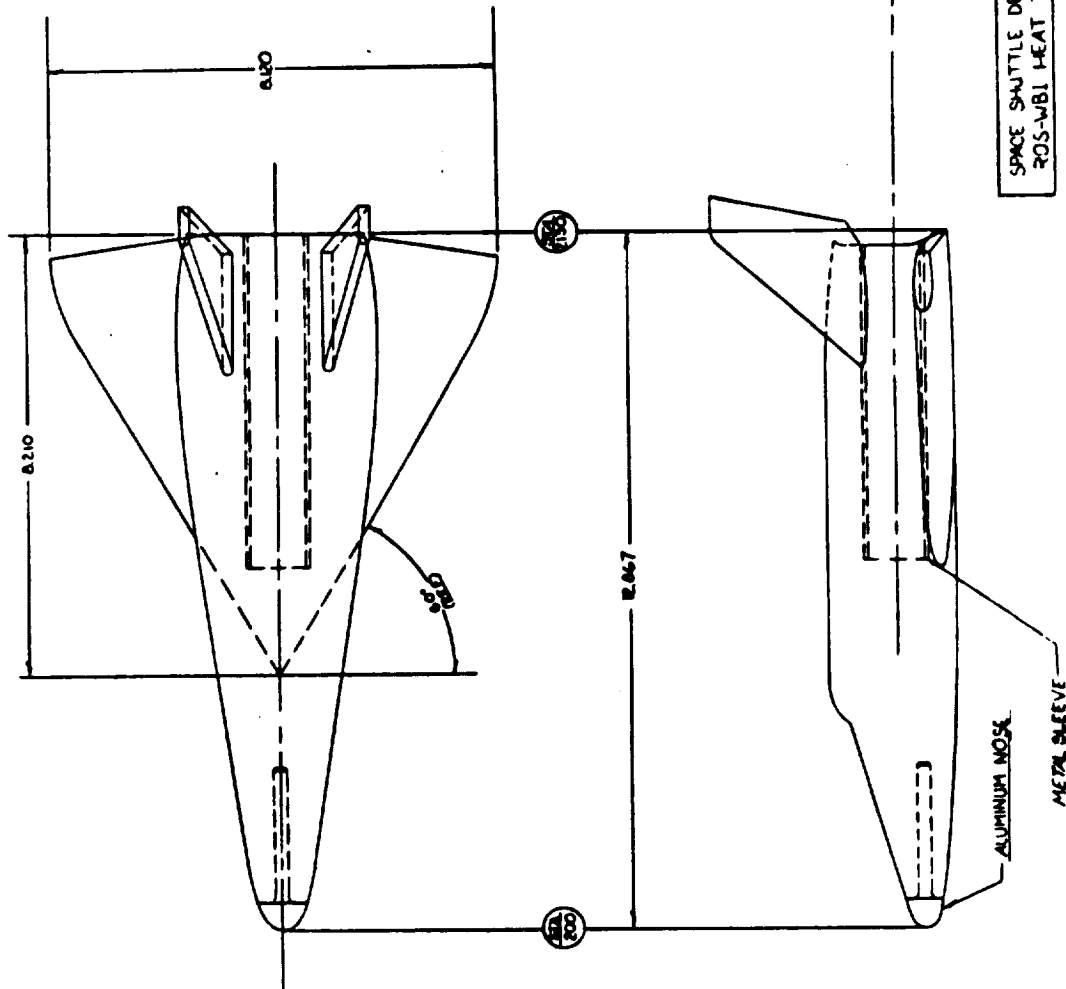


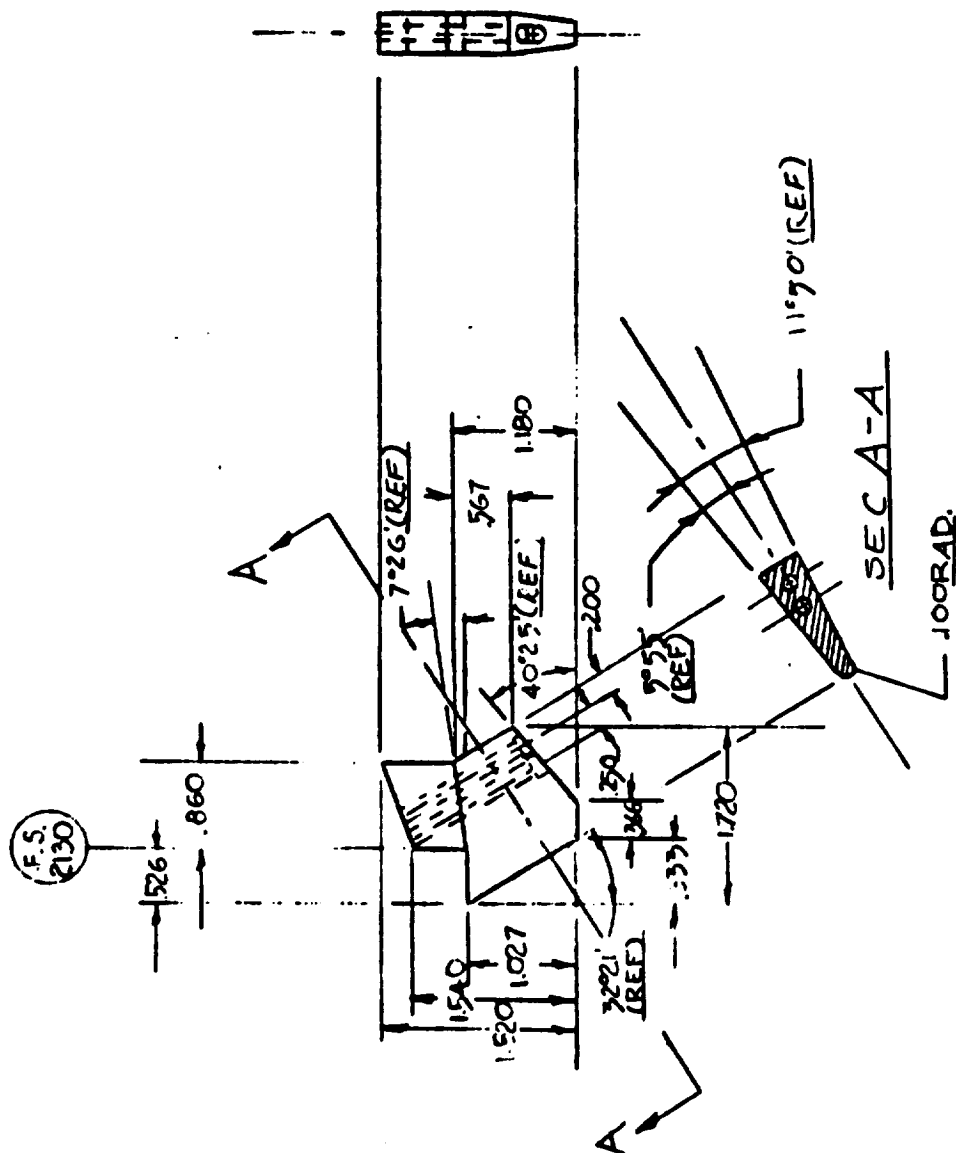
FIGURE 2



SPACE SHUTTLE DELTA-WING ORBITER
ROS-WBI HEAT TRANSFER MODEL

DELTA WING ORBITER
GAC
DR#1154 B-3-19

FIGURE 3



VENTRAL FIN [UIN]

1/150 SCALE HEAT

TRANSFER MODEL

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: NASA-LOCKHEED SPACE SHUTTLE ORBITER HEAT TRANSFER TEST
 TEST NUMBER: VBO288
 TEST DATE: 10 April 1972
 TEST FACILITY: AEDC Tunnel B
 TEST ENGINEER: W.R. Martindale

RUN NO.	MODEL CONFIG. IDENTIFICATION	MODEL SCALE	FREE STREAM MACH NUMBER	TOTAL PRESSURE (PSIA)	TOTAL TEMP. (°R)	$\frac{T_{av}}{T_{total}}$	$\frac{REX_{10}}{FT.}$	PHASE CHANGE TEMP. (°F)	MODEL POSITION		
									α	β	ϕ
1	2	0.012	7.94	192	1233	1.0	0.970	200	40	0	180
2	3		7.94	191	1237		0.962	200	40		
3	2		7.94	193	1236		0.975	125	40		
4	3		7.94	193	1239		0.968	125	40		
5	2		7.94	193	1237		0.972	225	50		
6	3		7.94	193	1237		0.969	225	50		
7	2		7.94	191	1238		0.960	125	50		
8	3		7.94	193	1239		0.969	225	60		
9	2		7.94	193	1239		0.971	225	60		
10	3		7.94	193	1239		0.970	125	60		
11	1		7.94	194	1239		0.975	150	20		
12	2		7.94	192	1239		0.965	150	20		
13	3		7.94	192	1240		0.962	150	20		
14	1		7.94	192	1240		0.961	106	20		
15	3		7.94	193	1240		0.966	106	20		
16	1		7.94	192	1239		0.965	175	25		
17	2		7.94	192	1239		0.966	175	25		
18	1		7.94	191	1239		0.959	106	25		
19	3		7.94	192	1239		0.962	175	30		
20	2		7.94	192	1239		0.965	175	30		

DELTA WING ORBITER
LMSC

DR#1266 B-3-21

1000

TABLE 3 (cluded)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

DELTA WING ORBITER
LMSC
DR#1266 B-3- 22

TEST TITLE: NASA-LOCKHEED SPACE SHUTTLE ORBITER HEAT TRANSFER TEST

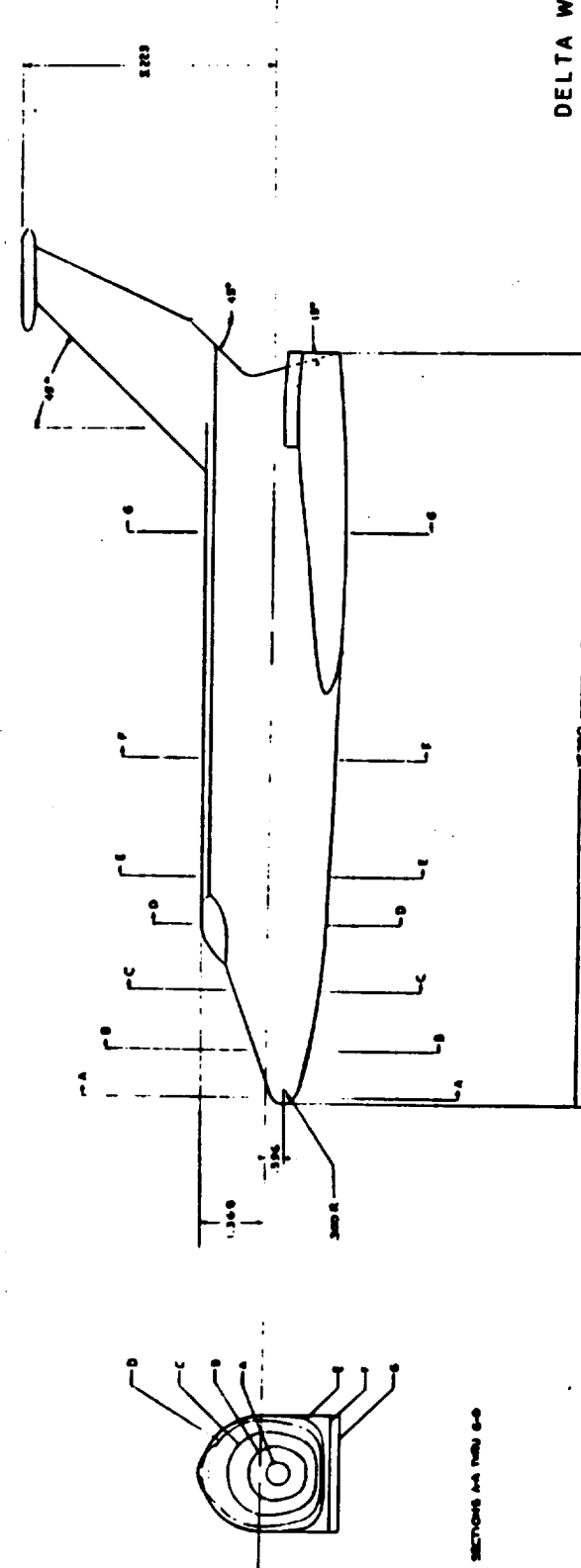
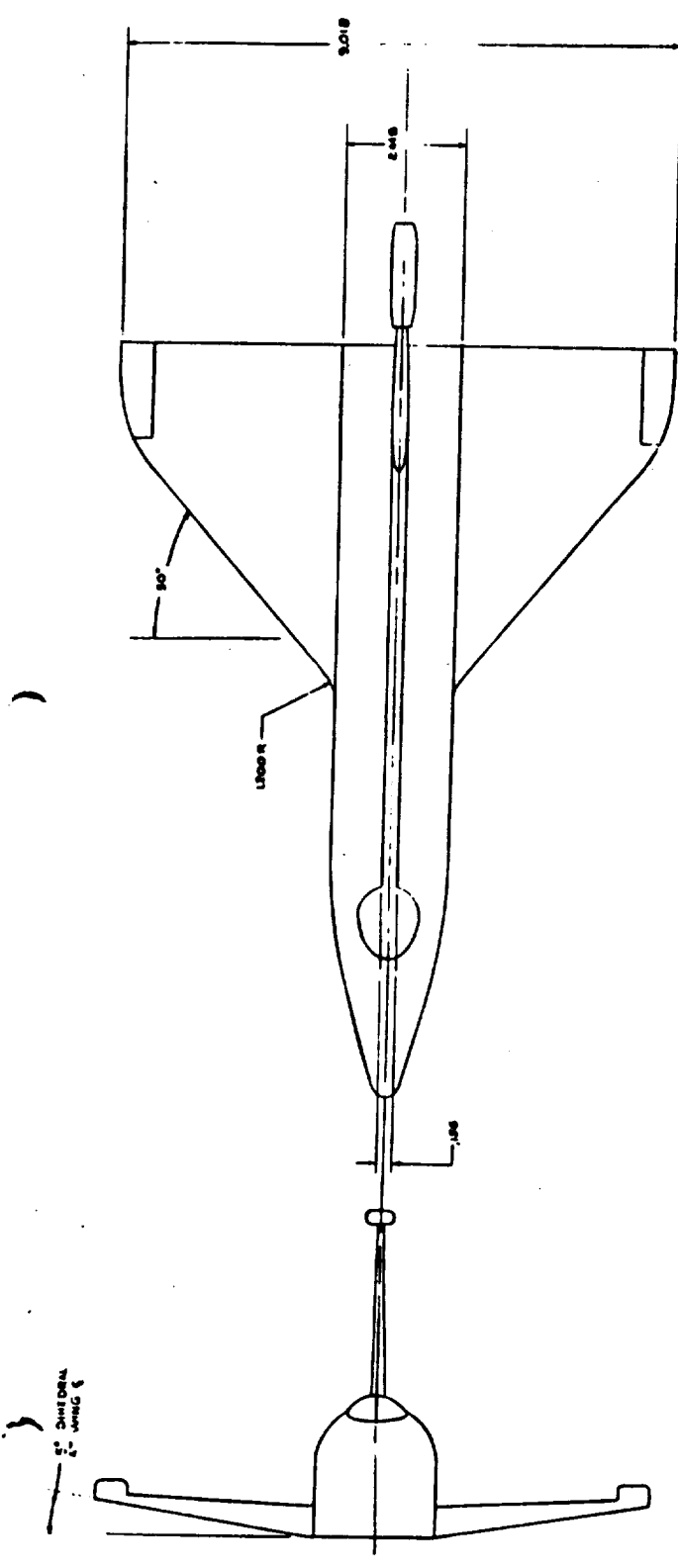
TEST NUMBER VBO288

TEST FACILITY: AEDC Tunnel B

TEST DATE: 10 April 1972

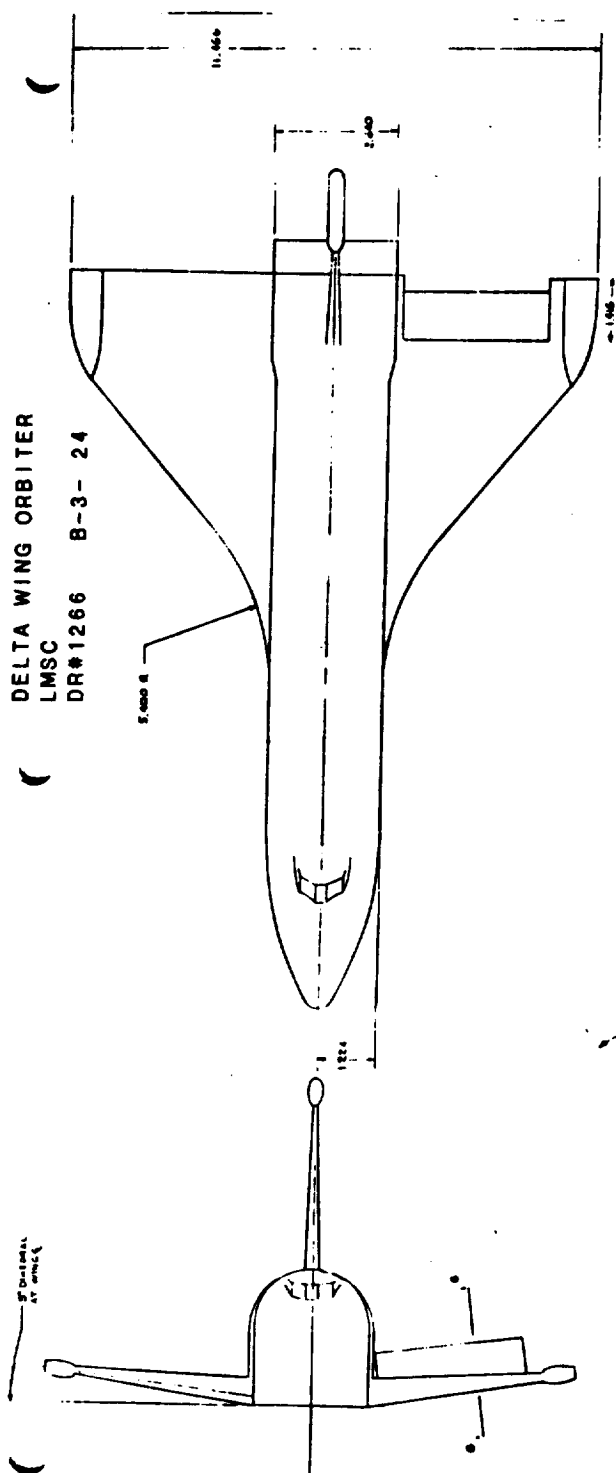
TEST ENGINEER: W.R. Martindale

RUN NO.	MODEL CONFIG. IDENTIFICATION	MODEL SCALE	FREE STREAM MACH NUMBER	TOTAL PRESSURE (PSIA)	TOTAL TEMP. (OR)	$\frac{T_{av}}{T_{total}}$	$\frac{R_{Bx10^6}}{Ft.}$	PHASE CHANGE TEMP. (OF)	MODEL POSITION		
									α	β	ϕ
21	1	0.012	7.94	192	1239	1.0	0.965	200	30	0	180
22	2		7.94	193	1240		0.972	106	30		
23	3		7.94	194	1240		0.972	106	30		
24	2		7.94	193	1240		0.969	200	35		
25	3		7.94	191	1240		0.959	200	35		
26	2		7.94	193	1241		0.965	106	35		
27	1		7.94	191	1241		0.959	200	30		
28	2		7.94	192	1239		0.966	150	30		
29	1		7.94	191	1240		0.959	100	30		
30	3		7.96	320	1268		1.54	200	30		
31	2		7.96	318	1272		1.52	200	30		
32	3		7.98	508	1293		2.36	225	30		
33	2		7.98	504	1298		2.33	225	30		
34	1		7.98	500	1301		2.30	225	30		
35	3		8.00	862	1330		3.81	275	30		
36	2		8.00	860	1329		3.81	100	30		
37	1		8.00	862	1334		3.80	275	30		
38	3		8.00	860	1336		3.78	350	30		
39	2		8.00	861	1339		3.77	150	30		
40	3		8.00	862	1337		3.78	113	30		



DELTA WING ORBITER
LMSC
DR#1266 B-3-23

Fig. 1 Sketch of LMSC 040C Delta Wing Orbiter Model



SECTION G-G
ROTATED 90° CCW

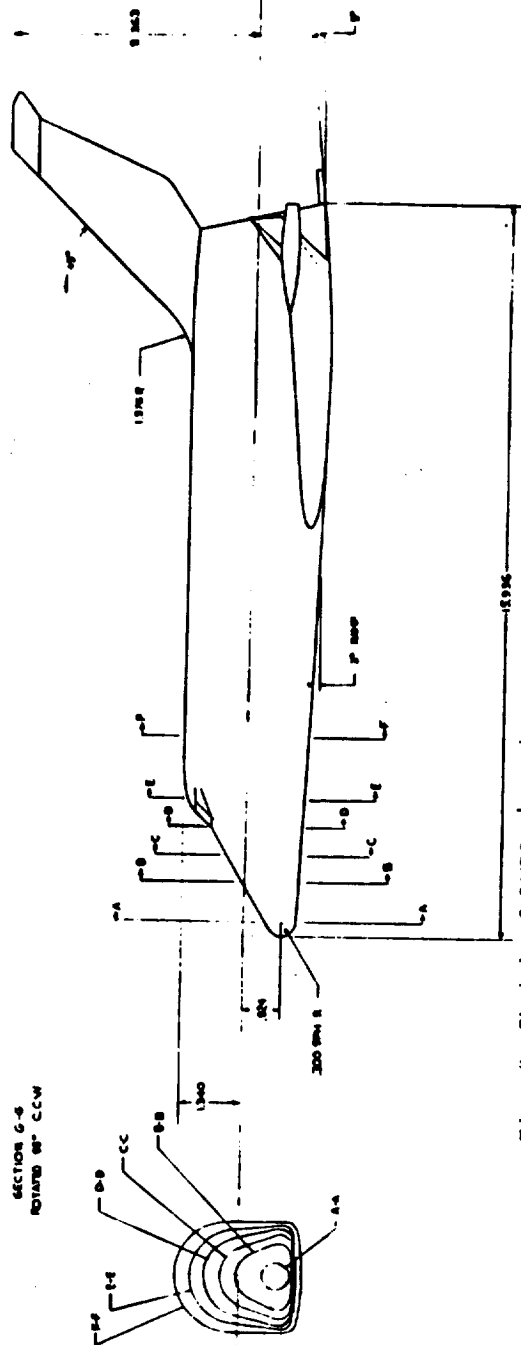


Fig. 2 Sketch of LMSC 040A-1/1 Delta Wing Orbiter Model

TABLE II
TEST SUMMARY FOR THE TUNNEL F MDAC-DWO MODEL

α , Deg.	Run	$\sim M_\infty$	$\sim Re_{\infty, l}$	Model Orien- tation*	Phosphor Paint Area	Final Paint Picture
10.0	3654	10.0	$8-22 \times 10^6$	U	1, 3	1, 3
10.0	3656	10.2	8×10^6	D	1, 2, 3	side
20.0	3650	10.4	$6-10 \times 10^6$	D	1, 2, 3	3
20.0	3651	10.7	$10-20 \times 10^6$	D	1, 2, 3	2, 3
20.0	3652*	10.3	9×10^6	U	1, 3	1, 3
25.0	3667	11.2	$2-6 \times 10^6$	D	1, 2, 3	2
30.0	3653	10.4	$7-20 \times 10^6$	U	1, 3	1, 3
30.2	3655	10.5	$5-17 \times 10^6$	D	1, 2, 3	2, 3
40.5	3657	10.4	$9-11 \times 10^6$	U	1, 3	1, 3
40.2	3661	10.5	$6-13 \times 10^6$	D	1, 2, 3	2
45.0	3660	11.9	$7-10 \times 10^6$	D	1, 2, 3	3
45.2	3662	11.4	$2-5 \times 10^6$	D	1, 2, 3	2
45.0	3663	11.8	$3-9 \times 10^6$	D	1, 2, 3	2
51.0	3659	10.7	$7-22 \times 10^6$	U	1, 3	1, 3
50.2	3664	10.5	$5-9 \times 10^6$	D	1, 2, 3	2, 3
60.5	3658*	10.6	$6-24 \times 10^6$	U	1, 3	-
60.2	3665	10.4	$5-11 \times 10^6$	D	1, 2, 3	3

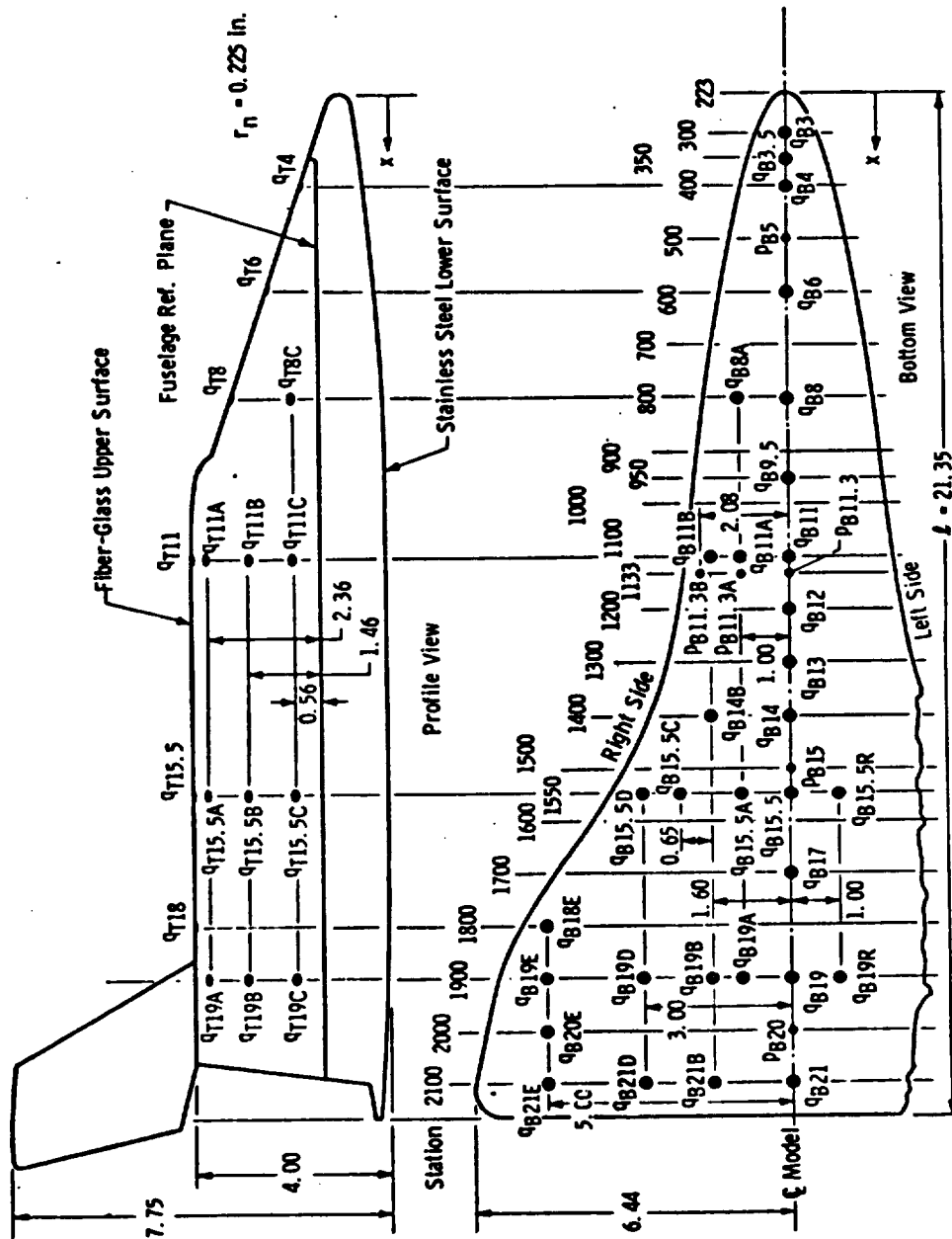
*Model Orientation: D - Model Lower Surface Down Toward Tunnel Floor

U - Model Lower Surface Up Toward Tunnel Ceiling

*Three point Pitot Survey

Phosphor Paint Legend: 1 - Fuselage Top and Wing Top
 2 - Entire Lower Surface
 3 - Fuselage Side and Vertical Tail

ORIGINAL PAGE IS
OF POOR QUALITY



All Dimensions in Inches Configuration No. 1 Model Scale: 0.011

McDonnell Douglas Delta Wing Orbiter Model

Fig. 3 Instrumentation Layout for the Tunnel F MDAC-DWO Model

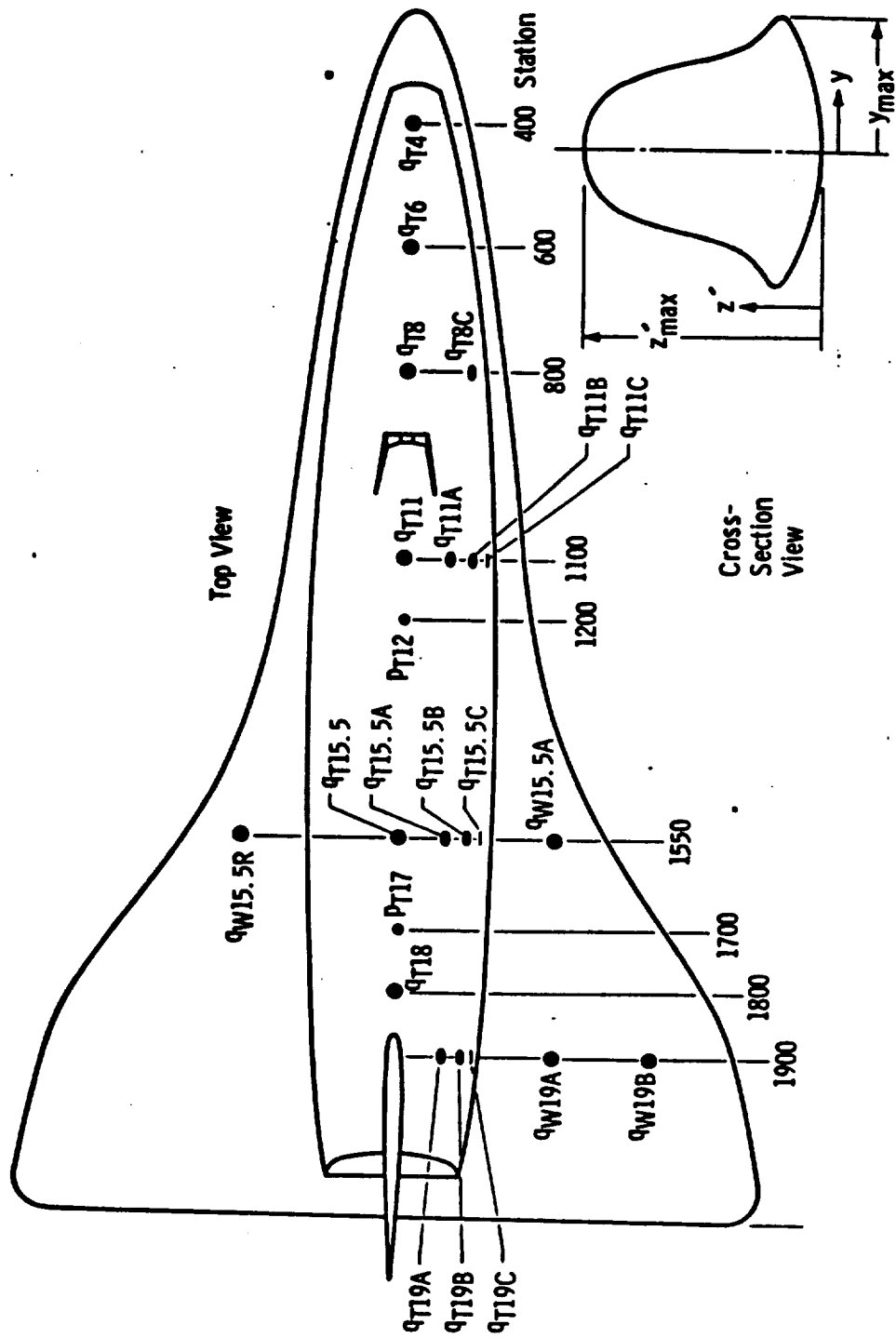


Fig. 3 Concluded

1008

DELTA WING ORBITER
MDAC
DR#1206 B-3- 27

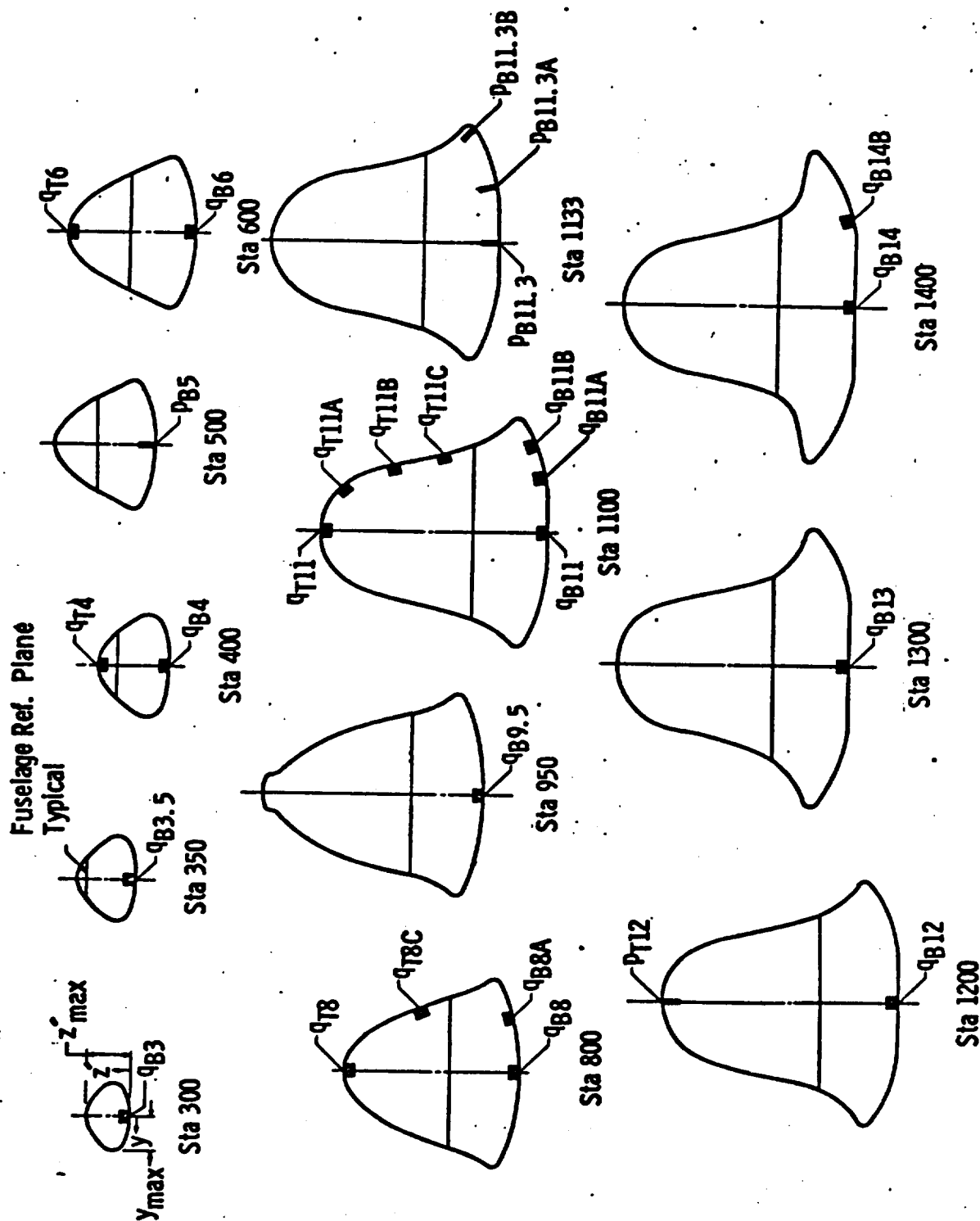
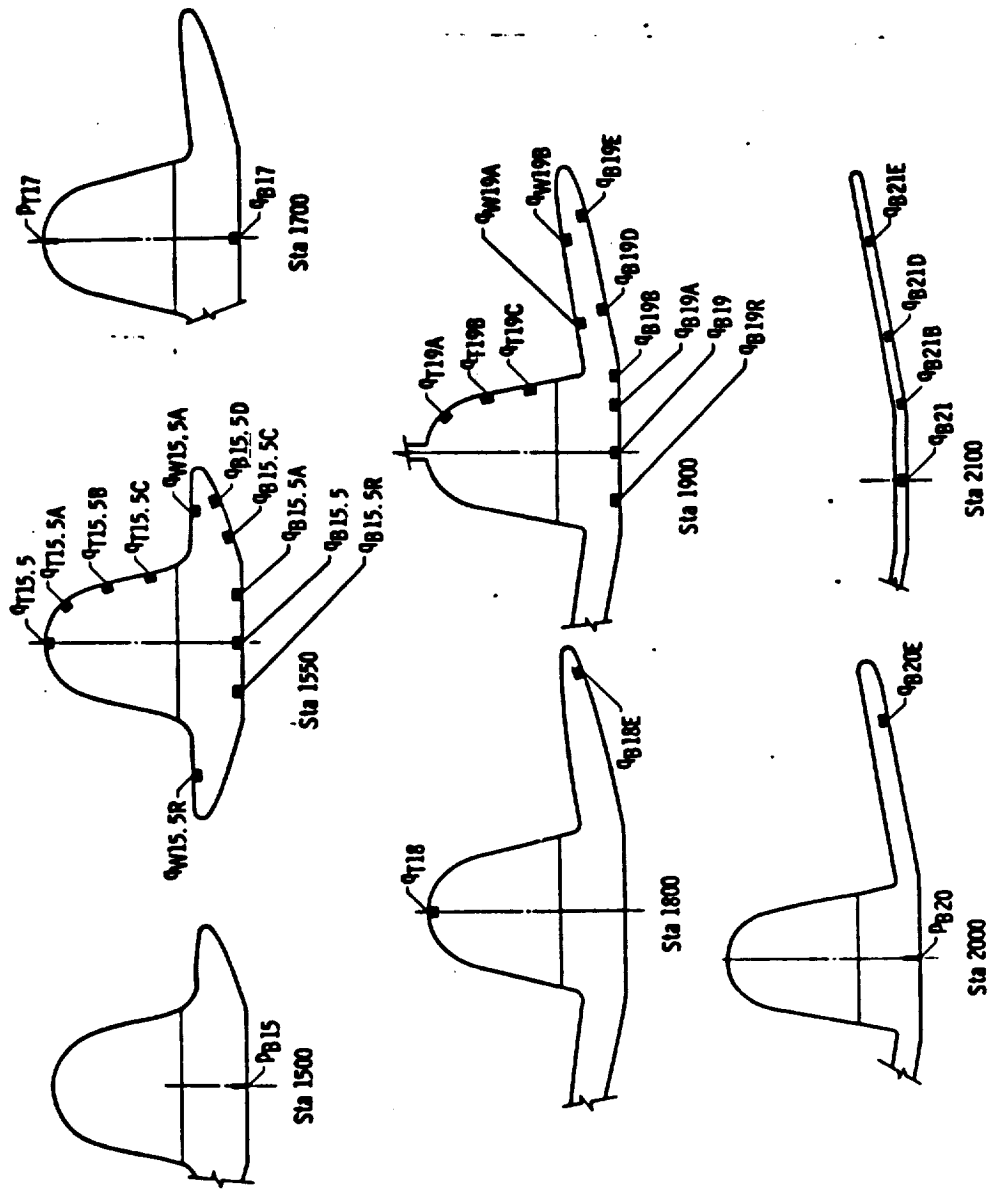


Fig. 4 Instrumented Cross-Section Views for the Tunnel F MDAC-DWO Model



All Contours Obtained from McDonnell Douglas Loft Lines.
 Dwg. No. 255BJ00050 Rev. "g" of Delta Wing Orbiter.

Fig. 4 Concluded

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE 2.

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: REENTRY HEAT TRANSFER TEST OF MDAC-DMO
TEST NUMBER: VT1162 TEST FACILITY: VKF Tunnel B
TEST DATE: JUNE, 1971 TEST ENGINEER: R. K. Matthews

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * T _{total}	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	β	ϕ	
142	MDAC-DMO	0.011	8.0	555	1310	1.0	2.5	125	10	0	180	BOTTOM
146								113	10			
138								200	20			
137								113	30			
141								125	20			
116								200	40			
135								200	40			
117								200	50			
125								250	60	0	180	BOTTOM
156	MDAC-DMO (No Trips)			860	1345		3.7	113	10			
152								150	10			
154								125	10			
155								155	20			

* Taw = adiabatic wall temperature

TABLE 2 - CONTINUED

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: REENTRY HEAT TRANSFER TEST OF MDAC-DWO
 TEST NUMBER: VT1162 TEST FACILITY: VKF Tunnel B
 TEST DATE: June, 1971 TEST ENGINEER: R. K. Matthews

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw • Ttotal	RNX10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	β	ϕ	
162	MDAC-DWO (No Trips)	0.011	8.0	860	1345	1.0	3.7	300	30	0	180	BOTTOM
153								200	30			
185								250	40			
187								200	40			
189								200	50			
191								250	60	0		
169	MDAC-DWO (Trips)	0.011	8.0	860	1345	1.0	3.7	200	10	0	180	BOTTOM
168								300	20			
159								300	30			
161								300	30			
170								300	40			
176								400	40			
174								400	50			

* Taw = adiabatic wall temperature

DELTA WING ORBITER
 MDAC
 DR#1207 B-3- 31

TABLE 2 - CONTINUED

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: REENTRY HEAT TRANSFER TEST OF MDAC-DWO
TEST NUMBER: VT1162 TEST FACILITY: VKI Tunnel B
TEST DATE: June, 1971 TEST ENGINEER: R. K. Matthews

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw • Ttotal	RNX196 Ft	Phase Change Temp. (°F)	Model Position (degrees)		Model Surface
									α	ϕ	
175	MDAC-DWO (Trips)	0.011	8.0	860	1345	1.0	3.7	400	60	0	BOTTOM
181	MDAC-DWO (Trips)	0.011	8.0	860	1345	1.0	3.7	350	50	0	BOTTOM
142	MDAC-DWO	0.011	8.0	555	1310	1.0	2.5	125	10	0	SIDE
146								113	10		
138								113	20		
135								113	40		
122							2.5	100	60		
150	MDAC-DWO (No Trips)	0.011	8.0	860	1345	1.0	3.7	100	10	0	SIDE
152								100	10		
156								113	10		
151								100	30		
185		0.04	8.0	860	1345	1.0	3.7	113	40		

* Taw = adiabatic wall temperature

TABLE 2 - CONTINUED

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: REENTRY HEAT TRANSFER TEST OF MDAC-DWO

TEST NUMBER: VT1162 TEST FACILITY: WAF Tunnel B

TEST DATE: June, 1971 TEST ENGINEER: R. K. Matthews

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	$\frac{T_{aw}}{T_{total}}$	$\frac{RNX10^6}{Ft}$	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	θ	ϕ	
159	MDAC-DWO (Trips)	0.011	8.0	860	1345	1.0	3.7	100	30	0	180	SIDE
161								113	30			
176								113	40			
174								113	50			
175								113	60			
181								113	60			
142	MDAC-DWO	0.011	8.0	555	1310	1.0	2.5	125	10	0	180	TOP
138								113	20			
137								113	30			
144								113	30			
116								113	40			
128								113	40			

* T_{aw} = adiabatic wall temperature

DELTA WING ORBITER
MDAC
DR#1207 B-3-33

ORIGINAL PAGE IS
OF POOR QUALITY

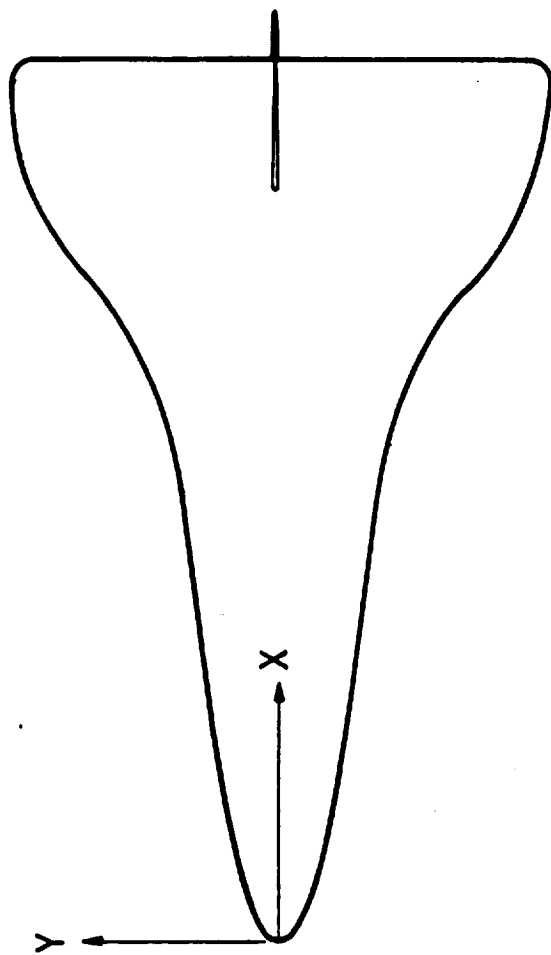
TABLE 2 - CONTINUED

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: REENTRY HEAT TRANSFER TEST OF MDAC-DWO
TEST NUMBER: VTL162 TEST FACILITY: VKF Tunnel B
TEST DATE: June, 1971 TEST ENGINEER: R. K. Matthews

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	$\frac{T_{aw}}{T_{total}}$	$\frac{RNX106}{Ft}$	Phase Change Temp. (°F)	Model Position (degrees)		Model Surface
									α	ϕ	
130	MDAC-DWO	0.011	8.0	555	1310	1.0	2.5	113	40	0	TOP
135		0.011	8.0	555	1310	1.0	2.5	113	40	0	TOP
117								113	50		
122								100	60		
152	MDAC-DWO (No Trips)	0.011	8.0	860	1345	1.0	3.7	100	10	0	TOP
162								100	30		
183								113	40		
185								113	40		
159	MDAC-DWO (Trips)	0.011	8.0	860	1345	1.0	3.7	100	30	0	TOP
176								113	40		
174								113	50		
175								113	50		
181								113	50		

* T_{aw} = adiabatic wall temperature



All Dimensions in Inches

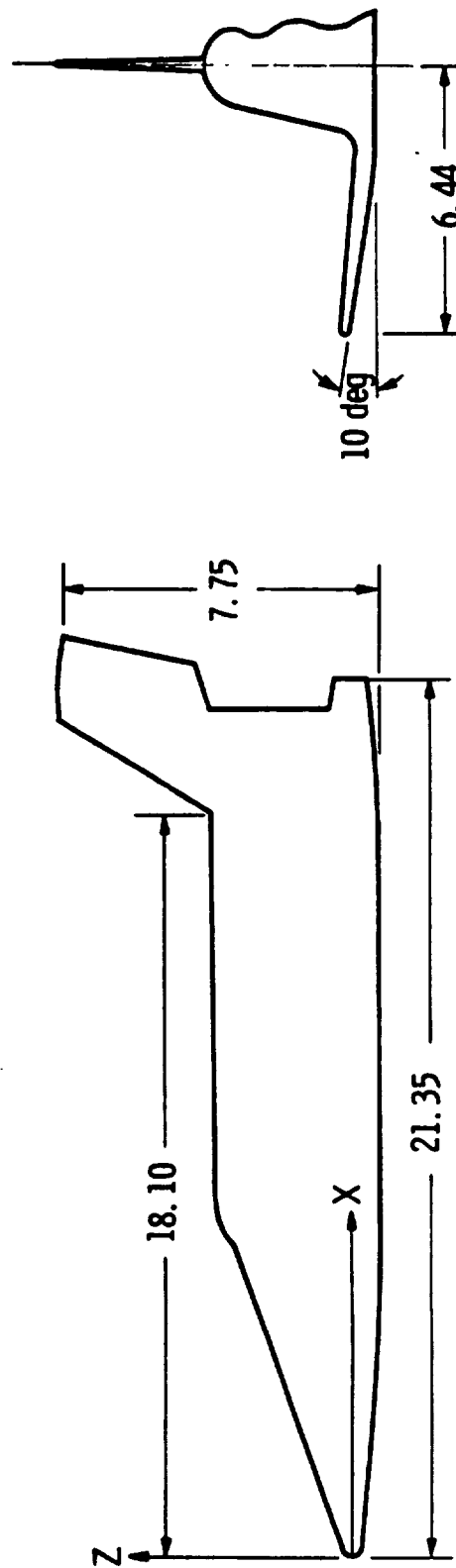


Fig. 1 McDonnell Douglas Delta Wing Orbiter Model Sketch (0.011 Scale)

DELTA WING ORBITER
MDAC
DR#1207 B-3-35

DELTA WING ORBITER
NR
DR#1056 8-3-30

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: 51 TEST FACILITY: LRC Continuous Flow Hypersonic Tunnel

TEST DATE: 8-3-70 to 8-6-70 TEST ENGINEER: H. Gorowitz, R. S. Raparelli

ORIGINAL PAGE IS
OF POOR QUALITY

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw • Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	φ	X	Y	Z
1	O ₁ δ _e =0° δ _r =0°	.0035	10.3	375	1760	.90	.5	175	45	0	0			
2								150	30					
3								275	50					
4								250	30					
5								200	50					
6								125	20					
7								125	15					
8								225	15					
9								225	20					
10	O ₂ δ _h =0°							225	60					
11	O ₃ δ _h =0°							150	30					
12	O ₁ δ _e =-7° δ _r =0°							200	50					
13	O ₁ δ _e =10° δ _r =+13°							175	30					

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

* Taw = adiabatic wall temperature

Page 11

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: 51 TEST FACILITY: LRC Continuous Flow Hypersonic Tunnel

TEST DATE: 8-3-70 to 8-6-70 TEST ENGINEER: H. Gorowitz, R. S. Raparelli

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw • Ttotal	RNX10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
14	$\delta_e = -7^\circ$ $\delta_r = 0^\circ$	.0035	10.3	375	1760	.90	.5	275	50	0	0			
15	$\delta_e = 10^\circ$ $\delta_r = +13^\circ$							250	30					
16	$\delta_h = 0^\circ$							300	60					
17								175	15					
18								175	30					
19								225	60					
20								250	30					
21	$\delta_h = -50^\circ$							225	60					
22	$\delta_h = -50^\circ$							300	60					
23	$\delta_h = 0^\circ$							150	30					
24								125	15					
25								200	15					
26	$\delta_e = -7^\circ$ $\delta_r = 0^\circ$							175	50					

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

* Taw = adiabatic wall temperature

Page 12

DELTA WING ORBITER
NR
DR#1056 B-3- 37

1016

DELTA WING ORBITER
NR
DR#1056 B-3- 38

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: 51 TEST FACILITY: LRC Continuous Flow Hypersonic Tunnel

TEST DATE: 8-3-70 to 8-6-70 TEST ENGINEER: H. Gorowitz, R. S. Reparelli

ORIGINAL PAGE IS
OF POOR QUALITY

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNX10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera ** Location (in)		
									α	φ	θ	X	Y	Z
27	02 δ _h =-50°	.0035	10.3	375	1760	.90	.5	125	60	0	0			
28	01 δ _e =-7° δ _r =0°							109	50					
29	01 δ _e =10° δ _r =+13°							125	30					
30	02 δ _h =0°							113	60					
31	01 δ _e =0° δ _r =0°							113	50					
32	03 δ _h =0°							113	30					
33	02 δ _h =-50°								60					
34	01 δ _e =0° δ _r =0°								20					
35	03 δ _h =0°								15					
36	01 δ _e =0° δ _r =0°								15					
37	03 δ _h =0°								60					
38	03 δ _h =0°								60					
39	02 δ _h =-50°							109	60					

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

* Taw = adiabatic wall temperature

Page 13

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: NR Run Nos. 1-58 TEST FACILITY: LRC M = 8 Variable Density Hypersonic Tunnel

TEST DATE: 8-10-70 to 8-14-70 TEST ENGINEER: H. Gorowitz, R. S. Raparelli

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNx10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera ** Location (in)		
									α	β	ϕ	X	Y	Z
1	O ₂ $\delta_h=0^\circ$	.0035	7.9	400	1405	1.0	1.9	200	30	0	0			
2	O ₂				1325			125						
3	O ₃				1425			200						
4	O ₁ $\delta_e=0^\circ$ $\delta_r=0^\circ$				1390			250						
5					1386			150						
6				1400	1490		5.5	300						
7	O ₂ $\delta_h=0^\circ$			1400	1458		5.5	300						
8	O ₃			400	1420		1.9	250	15					
9	O ₃				1385			125						
10	O ₁ $\delta_e=0^\circ$ $\delta_r=0^\circ$				1370			250						
11					1385			125						
12					1375			250	20					
13					1380			125						

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* Taw = adiabatic wall temperature

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: NR Run Nos. 1-58 TEST FACILITY: LRC M-8 Variable Density Hypersonic Tunnel

TEST DATE: 8-10-70 to 8-14-70 TEST ENGINEER: H. Gorowitz, R. S. Raparelli

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw Ttotal	RNK106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	φ	X	Y	Z
14	O3 δ _h =0°	.0035	7.9	400	1405	1.0	1.9	250	20					
15	O3 δ _h =0°				1390			125						
16	O1 δ _e =0° δ _r =0°				1395			225	0					
17					1425			125						
18					1415			125						
19	O3 δ _h =0°				1420			200						
20	O3 δ _h =0°				1395			125						
21	O1 δ _e =0° δ _r =0°				1420			225	30					
22					1415			125						
23					1400			225						
24					1445			125						
25					1390			225	53					
26					1450			150						

** Taw = adiabatic wall temperature

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

Page 16

ORIGINAL PAGE IS
OF POOR QUALITY

DELTA WING ORBITER
NR
DR#1056 B-3-41

1020

DELTA WING ORBITER
NR
DR#1056 B-3- 42

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: NR Run Nos. 1-58 TEST FACILITY: LRC M=8 Variable Density Hypersonic Tunnel

TEST DATE: 8-10-70 to 8-14-70 TEST ENGINEER: H. Gorowitz, R. S. Raparelli

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw • Ttotal	RNX106 Ft.	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
27	O ₁ $\delta_e=0^\circ$ $\delta_r=0^\circ$	.0035	7.9	400	1420	1.0	1.9	200	53	0	0			
28	O ₂			1400	1510		5.5	225						
29	O ₂				1459			300						
30	O ₁ $\delta_e=0^\circ$ $\delta_r=0^\circ$				1485			325						
31	O ₁ $\delta_e=0^\circ$ $\delta_r=0^\circ$				1435			500						
32	O ₂				1412			500						
33	O ₂ $\delta_h=-50^\circ$			400	1362		1.9	250	60					
34				1400	1365		5.5	500						
35	O ₁ $\delta_e=0^\circ$ $\delta_r=0^\circ$			1400	1488		5.5	500						
36	O ₂			400	1400		1.9	200	40					
37				1400	1485		5.5	500						
38				1400	1470		5.5	300						
39	O ₁ $\delta_e=0^\circ$ $\delta_r=0^\circ$			400	1410		1.9	200						

** X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

* Taw = adiabatic wall temperature

Page 17

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: NR Run Nos. 1-58

TEST FACILITY: LRC M=8 Variable Density Hypersonic Tunnel

TEST DATE: 8-10-70 to 8-14-70

TEST ENGINEER: H. Gorowitz, R. S. Raparelli

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw Ttotal	RNX10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α	β	ϕ	X	Y	Z
40	O ₁	$\delta_e=0^\circ$	$\delta_r=0^\circ$	1400	1450	1.0	5.5	300	40	0	0			
41				400	1400		1.9	250	20	5				
42					1435			125						
43	O ₃	$\delta_h=0^\circ$			1415			200						
44	O ₁	$\delta_e=10^\circ$	$\delta_r=+13^\circ$		1390			250	30					
45		$\delta_e=10^\circ$	$\delta_r=+13^\circ$		1415			125	30					
46		$\delta_e=-7^\circ$	$\delta_r=0^\circ$		1480			200	53					
47		$\delta_e=-7^\circ$	$\delta_r=0^\circ$		1445			125						
48		$\delta_e=0^\circ$	$\delta_r=0^\circ$		1413			200						
49		$\delta_e=0^\circ$	$\delta_r=0^\circ$		1445			125						
50	O ₂				1465			200						
51				1000	1485		4.0	300						
52				1000	1520		4.0	400						

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

* Taw = adiabatic wall temperature

Page 18

DELTA WING ORBITER
NR
DR#1056 B-3-43

1022

ORIGINAL FILED IN
C-2-1056-43

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Space Shuttle Orbiter Paint Heat Transfer Tests

TEST NUMBER: NR Run Nos. 1-58 **TEST FACILITY:** LRC M-8 Variable Density Hypersonic Tunnel

TEST DATE: 8-10-70 **TEST ENGINEER:**

ORIGINAL PAGE IS
OF POOR QUALITY

[illegible]

•• X axis parallel to stream (+downstream, -upstream)
Y axis (+right, -left, as viewed from the rear)
Z axis (+up, -down)

T_{aw} = adiabatic wall temperature

Page 19

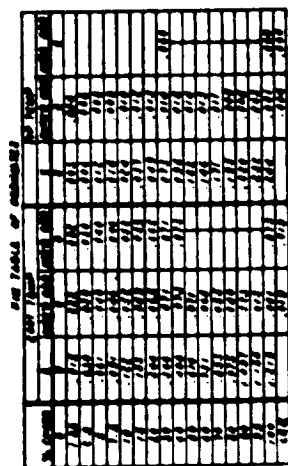
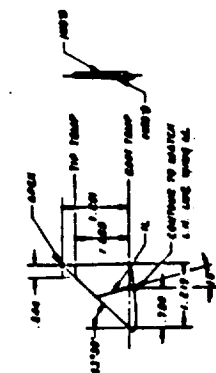
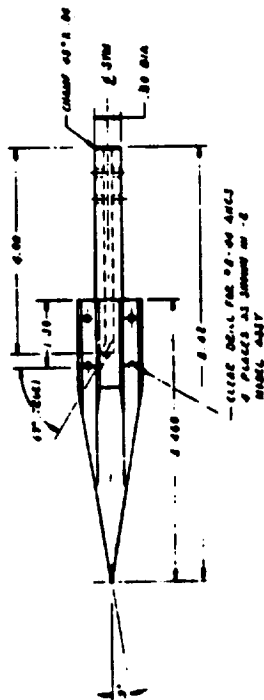


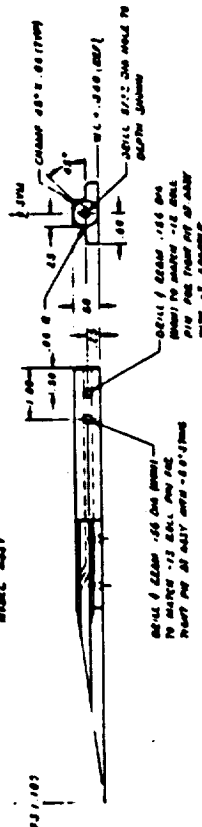
Figure 1. Delta Wing Orbiter, Model Assembly Drawing



007416 - 2 PM JUL 4 A (JANUS) : 0000 (0000)
 007417 - 2 PM JUL 4 A (JANUS) : 0000 (0000)
 007418 - 2 PM JUL 4 A (JANUS) : 0000 (0000)



APPRO 7/20/68
B. M. MONTGOMERY
JUL 20 1968

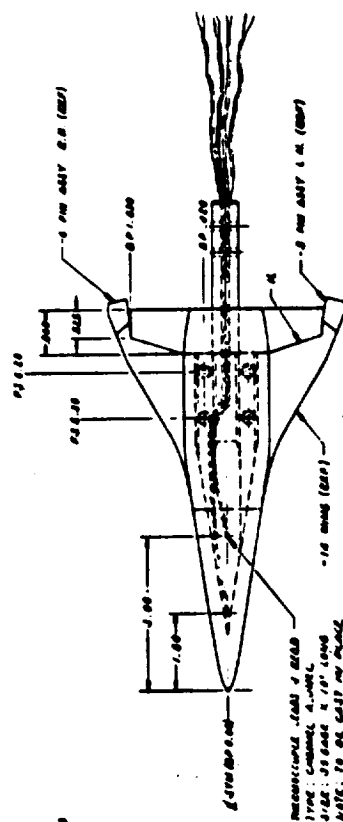


02-11-66 022000 -56 CDS (P) 101
 10 02-11-66 -13 0211 000 002
 02-11-66 022000 -56 CDS (P) 101

173 012-181 1.1
 1703 no p. 41 02000 1.100
 0010 2 120000; 0001 2- 70100

[illegible]

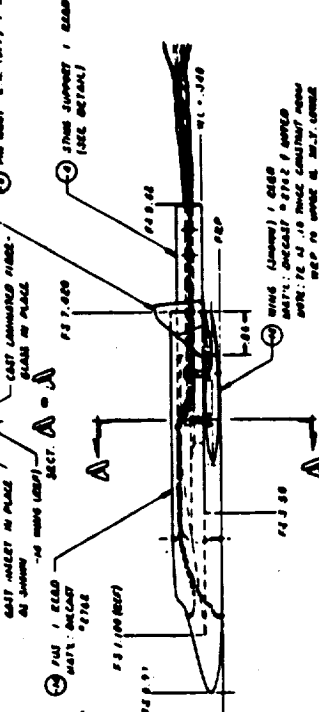
STATIONER INFORMATION SYSTEM
 ATMA 6000 200 67200 0 001 - 2666
 60000 0000 200 67200 0 001 - 2666



RECEIVED: 10-18-67
FROM: SAC, NEW YORK
SUBJECT: [illegible]
[illegible]



3) PIN ADV L.A. (HUMAN) / OTHER
LIFE DETAIL



(6) WINDS (Average) 9-10 KTS
WINDS (Gusts) 10-12 KTS
WINDS (Max) 12-14 KTS
WINDS (Min) 8-10 KTS
WINDS (Direction) 10-12 KTS

02000 13017 224 5 70

[illegible]

DELTA WING ORBITER
NR
DR#1165 B-3-46

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: NORTH AMERICAN ROCKWELL DELTA WING ORBITER (SSV-161B) HEAT TRANSFER TEST

TEST NUMBER: RLM TEST FACILITY: LRC M = 8 VARIABLE DENSITY TUNNEL

TEST DATE: 2-3-71 to 2-11-71 TEST ENGINEER: H. GOROWITZ, R. S. RAPARELLI

Run No.	Model Configuration Identification		Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
	δe°	δSB°								α°	φ°	θ°	X	Y	Z
1	0 ₁	0	0	.0035	400	1405		1.9	125	10	0	0			
2						1360			250						
3	0 ₁ + T ₁					1355			109						
4	0 ₁ + D	15	35			1350			109						
5	0 ₁ + T ₁	0	0			1330			125	20					
6	0 ₁					1350			125						
7	0 ₁ + D	15	35			1325			138						
8						1340			125	15					
9	0 ₁ + T ₂	0	0		1500	1495		6	250						
10	0 ₁ + D	15	35			1575			200						
11	0 ₁	0	0			1445			200						
12					400	1400		1.9	125						
13	0 ₁ + T ₃				1500	1480		6	182						

* Taw : adiabatic wall temperature

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

δe = Elevon Deflection

δSB = Speed Brake Deflection

T = Boundary Layer Trip

D = Flow Deflector

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: NORTH AMERICAN ROCKWELL DELTA WING ORBITER (SSV-161B) HEAT TRANSFER TEST

TEST NUMBER: RLM TEST FACILITY: LRC M - 8 VARIABLE DENSITY TUNNEL

TEST DATE: 2-3-71 to 2-11-71 TEST ENGINEER: H. GOROWITZ, R. S. RAPARELLI

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
									α°	β°	ϕ°	X	Y	Z
14	$O_1 + T_4$	0	0	1500	1525		6	182	15	0	0			
15	O_1			400	1385		1.9	150	25					
16	O_1			1500	1485		6	200						
17	$O_1 + T_4$				1475			250						
18	$O_1 + D + T_4$	15	35		1530			300						
19	$O_1 + D$	15	0	400	1395		1.9	150						
20				1500	1485		6	300						
21					1480			250						
22	O_1	0	0		1455			200	20					
23	$O_1 + T_3$				1465			300						
24	$O_1 + D + T_4$	15	35		1485			350						
25	$O_1 + D$				1460			200						
26	$O_1 + D + T_4$				1450			250	15					

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

* Taw : adiabatic wall temperature

Page 2.2
2

DELTA WING ORBITER
NR
DR#1165 B-3-47

1026

REPRODUCED FROM
OF POOR QUALITY

DELTA WING ORBITER
NR
DR#1165 B-3-48

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: NORTH AMERICAN ROCKWELL DELTA WING ORBITER (SSV-161B) HEAT TRANSFER TEST

TEST NUMBER: RLM TEST FACILITY: LRC M = 8 VARIABLE DENSITY TUNNEL

TEST DATE: 2-3-71 to 2-11-71 TEST ENGINEER: H. GOROWITZ, R. S. RAPARELLI

ORIGINAL PAGE IS
OF POOR QUALITY

ER 2.2.3-13066
Page 24

Run No.	Model Configuration Identification		Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)		Camera** Location (in)		
	δe°	δSB°								α°	ϕ°	X	Y	Z
27		15	35	.0035	7.9	1500		6	200	15	0			
28						1500			175					
29		0	0			1500			250					
30						1490			300					
31						1460			250					
32						1480			200	10				
33						1475			175					
34		15	35			1500			150					
35		0	0		400	1380		1.9	200	30				
36						1385			150					
37					1500	1500		6	250					
38						1460			350					
39						1480			450					

* Taw : adiabatic wall temperature

** X axis parallel to stream (+ downstream, - upstream)

Y axis (+ right, - left, as viewed from the rear)

Z axis (+up, -down)

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: NORTH AMERICAN ROCKWELL DELTA WING ORBITER (SSV-161B) HEAT TRANSFER TEST

TEST NUMBER: RLM TEST FACILITY: LRC M - 8 VARIABLE DENSITY TUNNEL

TEST DATE: 2-3-71 to 2-11-71 TEST ENGINEER: H. GOROWITZ, R. S. RAPARELLI

Run No.	Model Configuration Identification	Model Scale		Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Camera** Location (in)		
		δe°	δSB°							α°	β°	φ°	X	Y	Z
40	O1 + T7	0	0	7.9	1500	1520		6	450	30	0	0			
41	O1 + D + T6	15	0			1505			450						
42						1465			550						
43	O1 + D				400	1390		1.9	200						
44	O1 + D + T8				1500	1500		6	350	25					
45						1475			450						
46	O1 + D + T6					1480			450						
47	O1 + D	15	35		400	1435		1.9	175	30					
48						1395			109						
49	O1	0	0			1395									
50						1345				25					
51	O1 + D	15	35			1380									
52						1335				20					

* Taw : adiabatic wall temperature
 ** X axis parallel to stream (+ downstream, - upstream)
 Y axis (+ right, - left, as viewed from the rear)
 Z axis (+ up, - down)

Page 2.2
 2

DELTA WING ORBITER
 NR
 DR#1165 B-3-49

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: NORTH AMERICAN ROCKWELL DELTA WING ORBITER (SSV-161B) HEAT TRANSFER TEST

TEST NUMBER: RLM TEST FACILITY: LRC M = 8 VARIABLE DENSITY TUNNEL

TEST DATE: 2-3-71 to 2-11-71 TEST ENGINEER: H. GOROWITZ, R. S. RAPARELLI

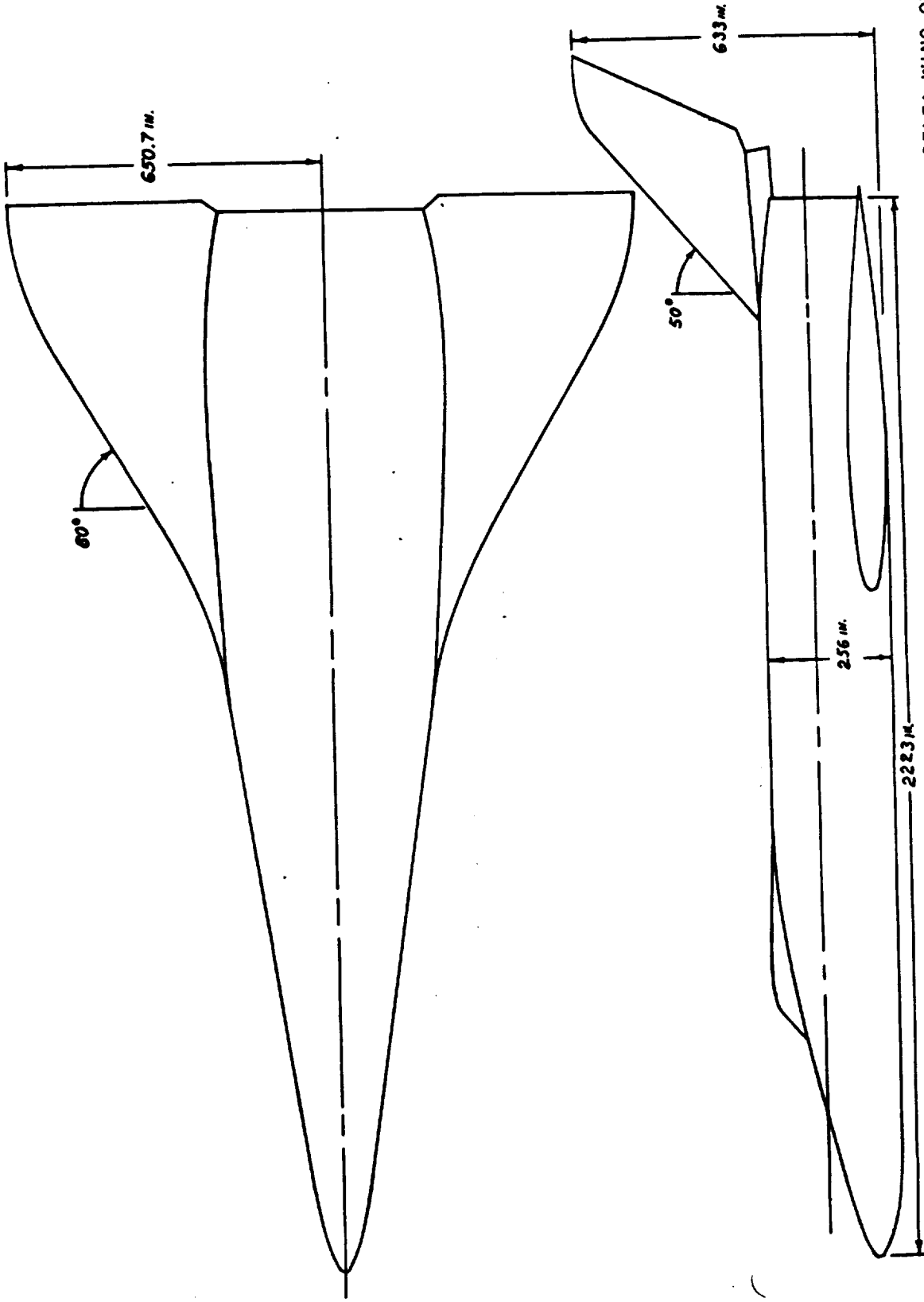
Run No.	Model Configuration Identification		Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	$\frac{T_{aw}}{T_{total}}$	$\frac{RNX10^6}{Ft}$	Phase Change Temp. (°F)	Model Position (degrees)		Camera** Location (in)		
	δ_e	δ_{SB}								α	ϕ	X	Y	Z
53	0	0	.0035	7.9	400	1360		1.9	109	20	0			
54	15	35				1380				15				
55	0	0				1395								
56	15	35				1400				10				
57	0	0				1400								
58					1500	1490		6	500	40				
59					400	1425		1.9	200					
60						1405			200	35				
61					1500	1490		6	500					
62						1465			400					
63						1460			250					
64					400	1380		1.9	250	55				
65					1500	1440		6	550					

** X axis parallel to stream (+downstream, -upstream)

Y axis (+right, -left, as viewed from the rear)

Z axis (+up, -down)

* T_{aw} : adiabatic wall temperature



DELTA WING ORBITER
NR
DR#1165 B-3-51

FIGURE 1. NR J3V-161-B DELTA WING ORBITER

1030

-59-
TABLE III
RUN SCHEDULE
DELTA-WING ORBITER

(Test 106: Runs 1 - 16, 18 - 26, 54 - 60, and 66)
 $M_\infty = 7.4$

Run	α , deg	β , deg	δ_e , deg	δ_r , deg	$Re_{\infty, L}$
55	-5	0	0	0	$.75 \times 10^6$
57	↓	↓	↓	↓	3.71
54	0	↓	↓	↓	.67
56	↓	↓	↓	↓	3.57
1	15	↓	↓	↓	1.14
2	↓	↓	↓	↓	3.88
18	↓	↓	↓	↓	6.21
60	↓	↓	↓	↓	7.34
19	↓	↓	+14	+20	.85
20	↓	↓	↓	↓	3.98
21	↓	-5	↓	↓	1.09
22	↓	↓	↓	↓	4.35
59	20	0	0	0	7.23
66	25	↓	↓	↓	7.00
3	30	↓	↓	↓	1.04
4	↓	↓	↓	↓	2.12
5	↓	↓	↓	↓	3.06
6	↓	↓	↓	↓	4.17
58	↓	↓	↓	↓	7.24
14	↓	↓	+10	+13	1.00
15	↓	↓	↓	↓	2.52
16	↓	↓	↓	↓	4.20
23	↓	-5	↓	↓	1.06
24	↓	↓	↓	↓	4.37
7	53	0	0	0	1.21
8	↓	↓	↓	↓	1.83
9	↓	↓	↓	↓	3.17
10	↓	↓	↓	↓	4.29
11	↓	↓	-7.5	↓	1.10
12	↓	↓	↓	↓	2.49
13	↓	↓	↓	↓	3.98
25	↓	-5	↓	↓	1.10
26	↓	↓	↓	↓	4.22

$L = 0.323$ meter (12.720 in.)
0.006 Model Scale
1031

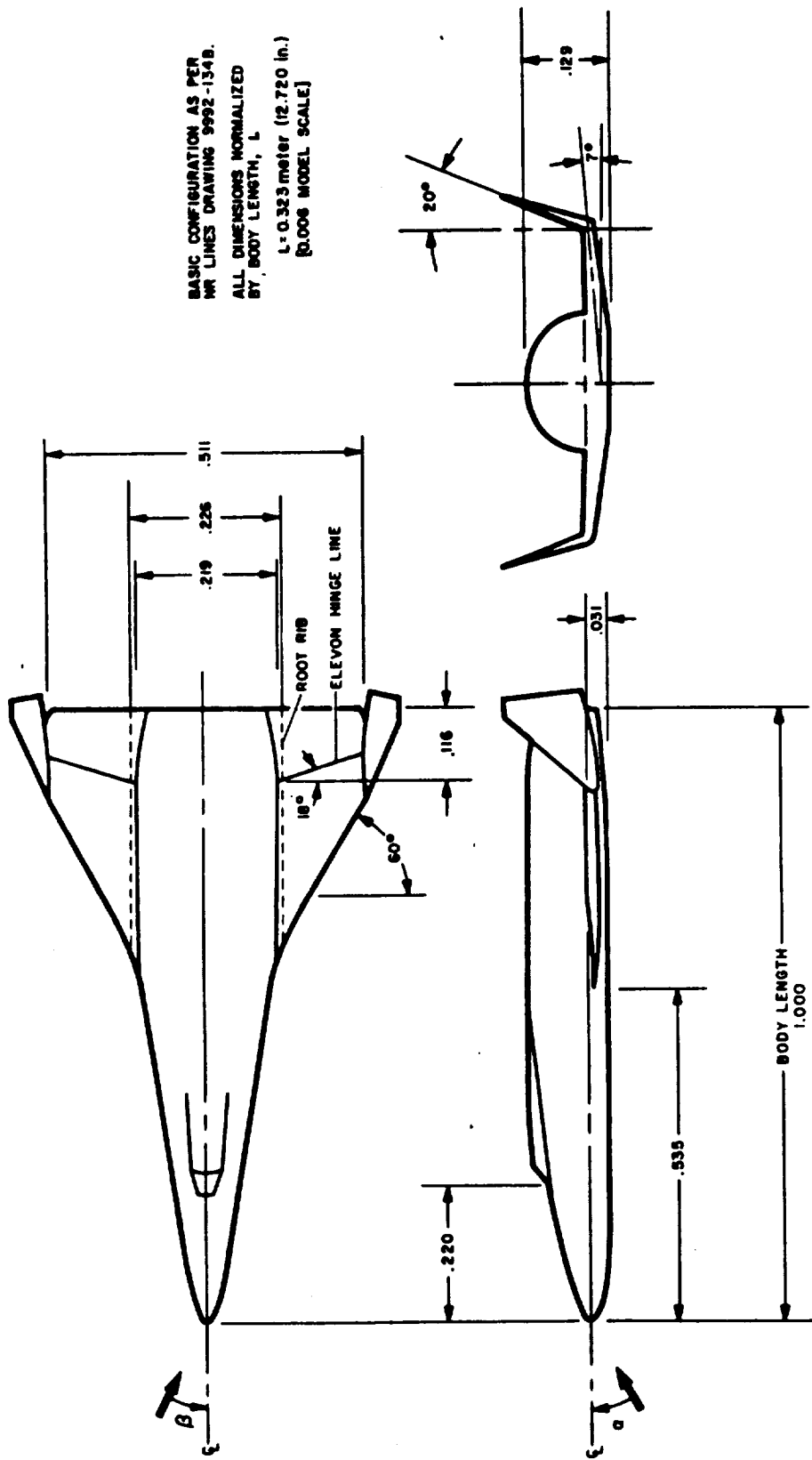
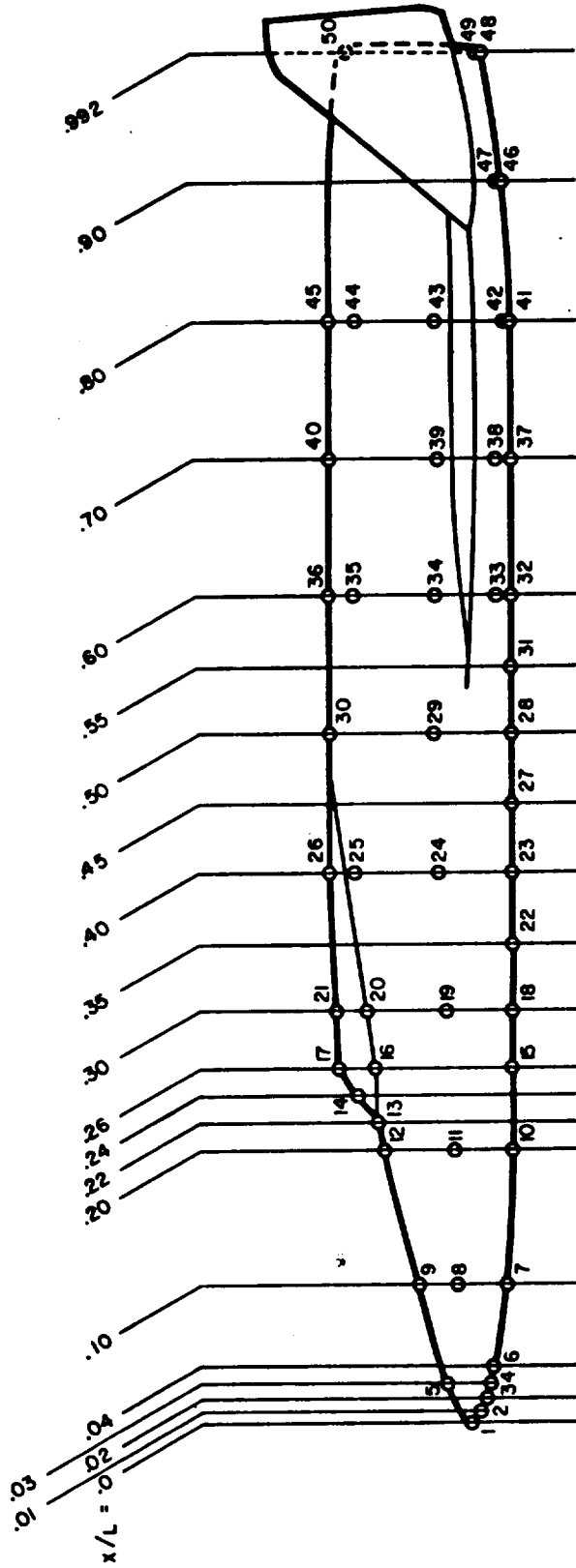
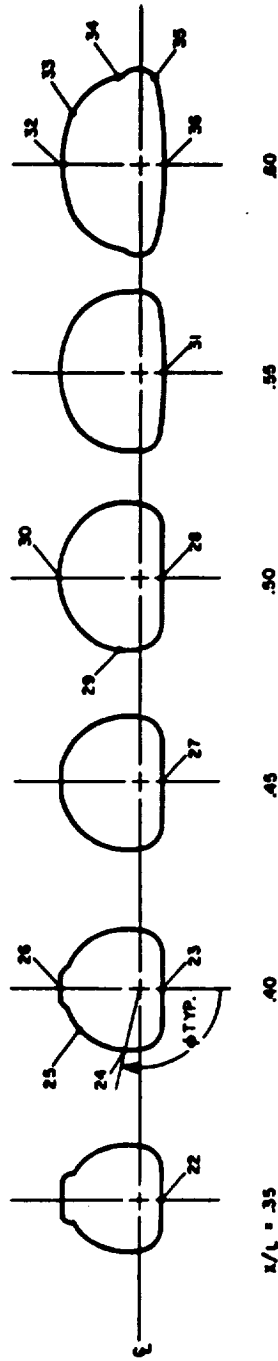
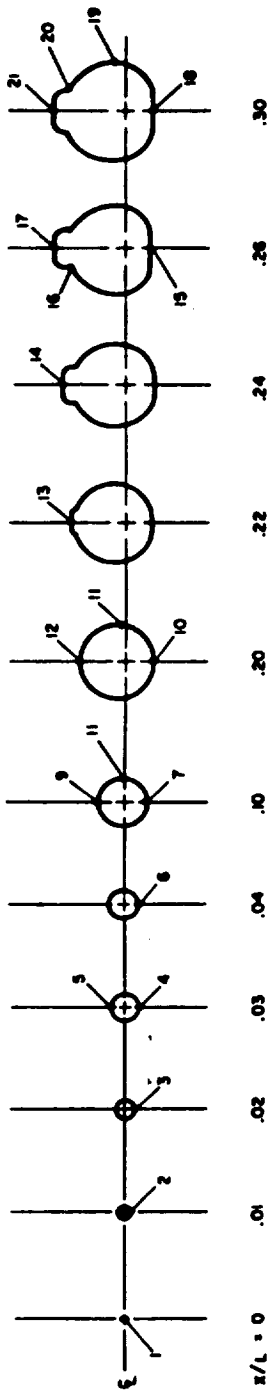


Figure 2. - Three-view drawing of delta-wing orbiter model with flow orientation.



(a) Body.

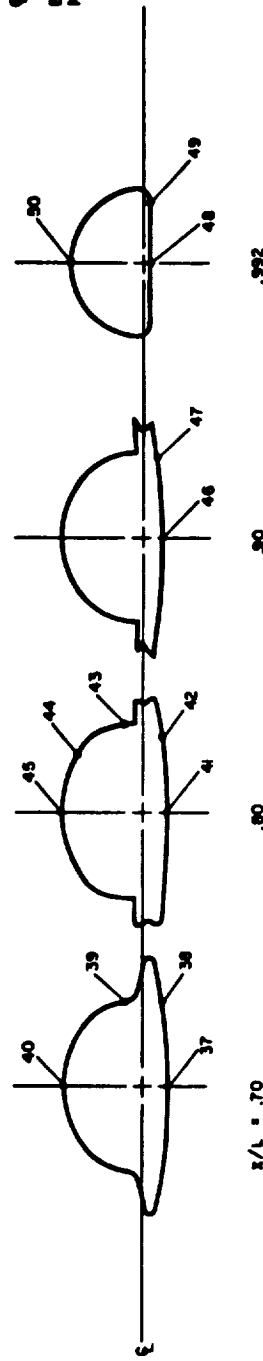
Figure 3. - Thermocouple locations for delta-wing orbiter model.



NOTE: ALL SECTIONS AS VIEWED
FROM REAR OF MODEL

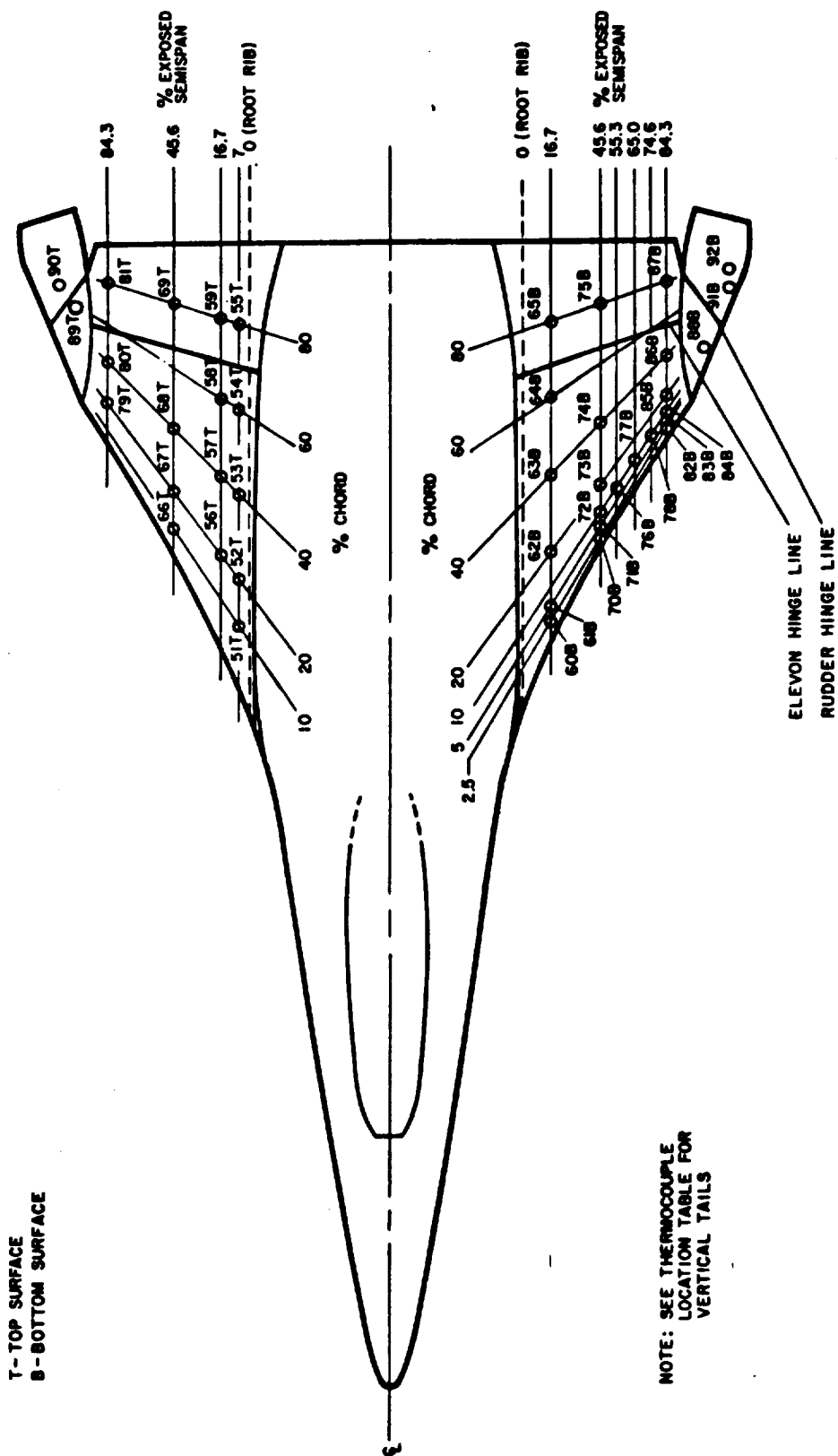
ξ AT W.L. \pm 998 cm (\pm .393 in.)

BODY SECTIONS AS PER
MR DRAWING S-930



(b) Body cross sections.
Figure 3. - Continued.

ORIGINAL PAGE IS
OF TYPE 100-100000



(c) Wing and twin vertical tails.

ORIGINAL PAGE IS
OF POOR QUALITY

Table 3

PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Reentry Heat Transfer Test of NAR-DMO

TEST NUMBER: VT1162-9

TEST FACILITY: VKF Tunnel B

TEST DATE: June & Sept. 1971

TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	T_{aw} / T_{total}	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)		Model Surface
									α	ϕ	
366	NAR-DMO (No Trips)	0.013	8.0	555	1310	1.0	2.5	113	10	0	Bottom
364								150	20		
365								175	20		
139								200	30		
118								200	40		
367	NAR-DMO (Eq Trips)	0.013	8.0	860	1345	1.0	3.7	150	10	0	Bottom
368								200	20		
369								225	30		
371								250	30		
377								300	40		
376								300	50		

* T_{aw} = adiabatic wall temperature

38

* T_{sw} = adiabatic wall temperature
+ Trips on bottom surface only

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	β	ϕ	
372	NAR-DHO (Trips) +	0.013	8.0	860	1345	1.0	3.7	150	10	0	180	Bottom
374								250	20			
160								300	30			
186								350	40			
184								400	50			
363	NAR-DHO (No Trips)	0.013	8.0	555	1310	1.0	3.7	113	10			Side
366								113	10			
364									20			
139								113	30			

TABLE 3. Continued
PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Reentry Heat Transfer Test of NAR-DHO
TEST NUMBER: VT1162-9 TEST FACILITY: VKF Tunnel B
TEST DATE: June & Sept. 1971 TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw • Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	β	φ	
118	NAR-DHO (No Trips)	0.013	8.0	555	1310	1.0	2.5	113	40	0	180	Side
123								113	40			
126								113	40			
121								150	50			
367	NAR-DHO (No Trips)*	0.013	8.0	860	1345	1.0	3.7	150	10	0	180	Side
368								200	20			
369								225	30			
371								250	30			
375								113	40			
377								113	40			
376								113	50			
386								225	50			

* Taw = adiabatic wall temperature
+ Trips on bottom surface only

DELTA WING ORBITER
NR
DR#1231 B-3-59

1038

ORIGINAL PAGE 13
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY

TABLE 3. Continued
PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Reentry Heat Transfer Test of NAR-DMD
TEST NUMBER: VT1162-9 TEST FACILITY: VKF Tunnel B
TEST DATE: June & Sept. 1971 TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Total	RNX10 ⁶ Ft	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	β	φ	
372	NAR-DMD (Trips)†	0.013	8.0	860	1345	1.0	3.7	150	10	0	180	Side
373								200	20			
374								250	20			
160								100	30			
180								113	40			
186								113	40			
182								113	50			
184								113	50	↑	↑	↑
363	NAR-DMD (No Trips)	0.013	8.0	555	1310	1.0	2.5	113	10	0	180	Top
366								113	10			
364								150	20			
365								175	20	↑	↑	↑

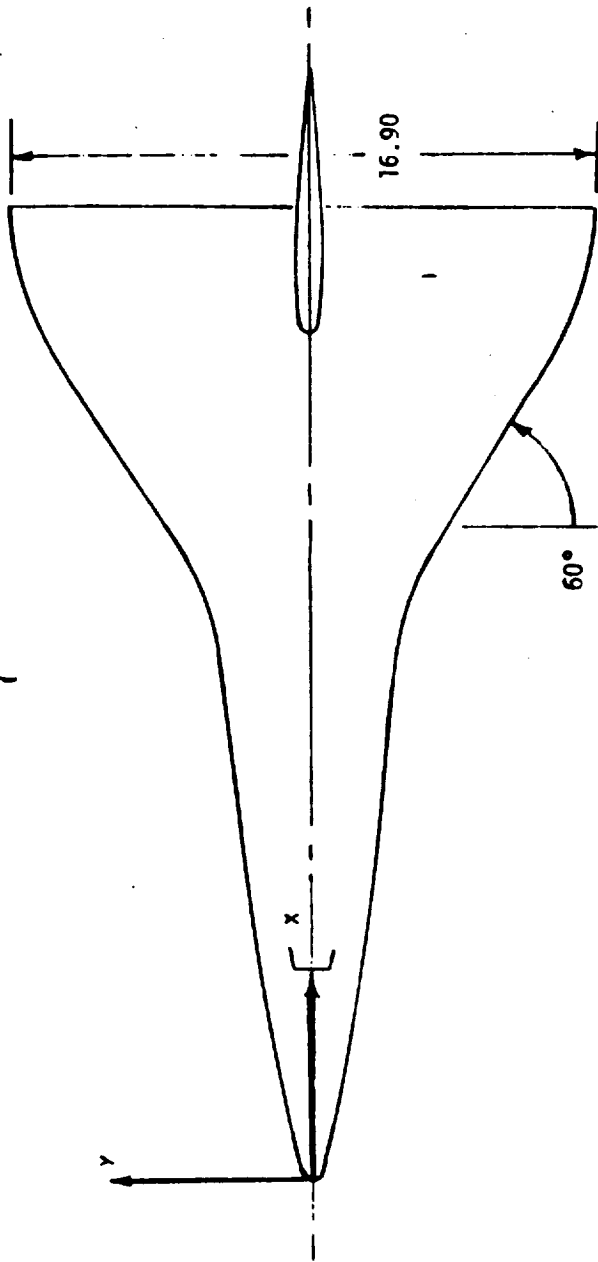
* Taw = adiabatic wall temperature
† Trips on bottom surface only

TABLE 3. Continued -
PHASE CHANGE COATING TEST DATA SUMMARY SHEET

TEST TITLE: Reentry Heat Transfer Test of NAR-DMO
TEST NUMBER: VT1162-9 TEST FACILITY: VKF Tunnel B
TEST DATE: June & Sept. 1971 TEST ENGINEER: R. K. Matthews & W. R. Martindale

Run No.	Model Configuration Identification	Model Scale	Free Stream Mach Number	Total Pressure (psia)	Total Temp. (°R)	Taw * Ttotal	RNX106 Ft	Phase Change Temp. (°F)	Model Position (degrees)			Model Surface
									α	β	φ	
139	NAR-DMO (No Trips)	0.013	8.0	555	1310	1.0	2.5	113	30	0	180	Top
118								113	40			
123								113	40			
126								113	40			
121								150	50	γ	↓	↓
367	NAR-DMO (No Trips)	0.013	8.0	860	1345	1.0	3.7	150	10	0	180	Top
368								200	20			
371								250	30			
375								113	40			
377								113	40			
376								113	50			↓
372	NAR-DMO (Trips) ⁺	0.013	8.0	860	1345	1.0	3.7	150	10			Top
373			γ	γ	↑	γ	γ	200	20	↓	↓	↓

* Taw = adiabatic wall temperature
+ Trips on bottom surface only



All Dimensions in Inches
Model Scale = 0.013

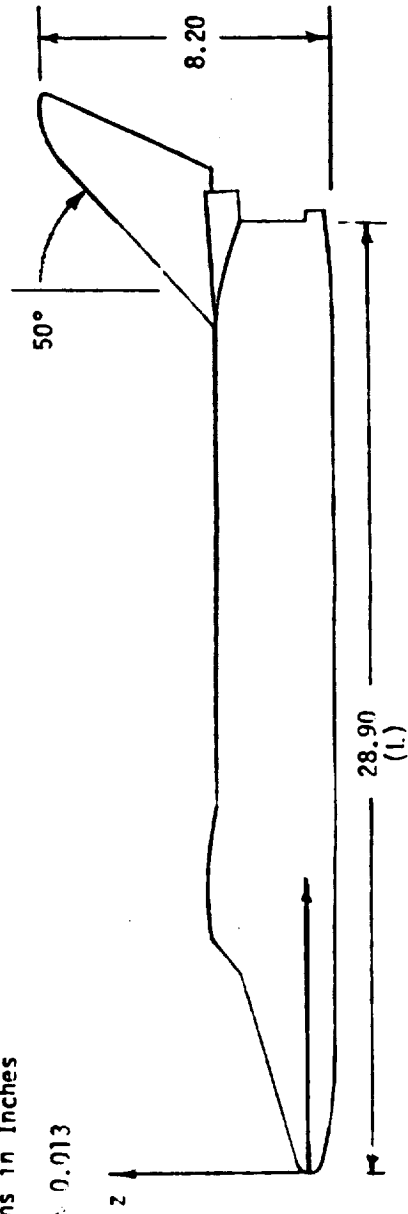


Fig. 1 North American Rockwell Delta Wing Orbiter Model Sketch

DELTA WING ORBITER
NR
DR#1231 B-3- 63

ORIGINAL PAGE IS
OF POOR QUALITY

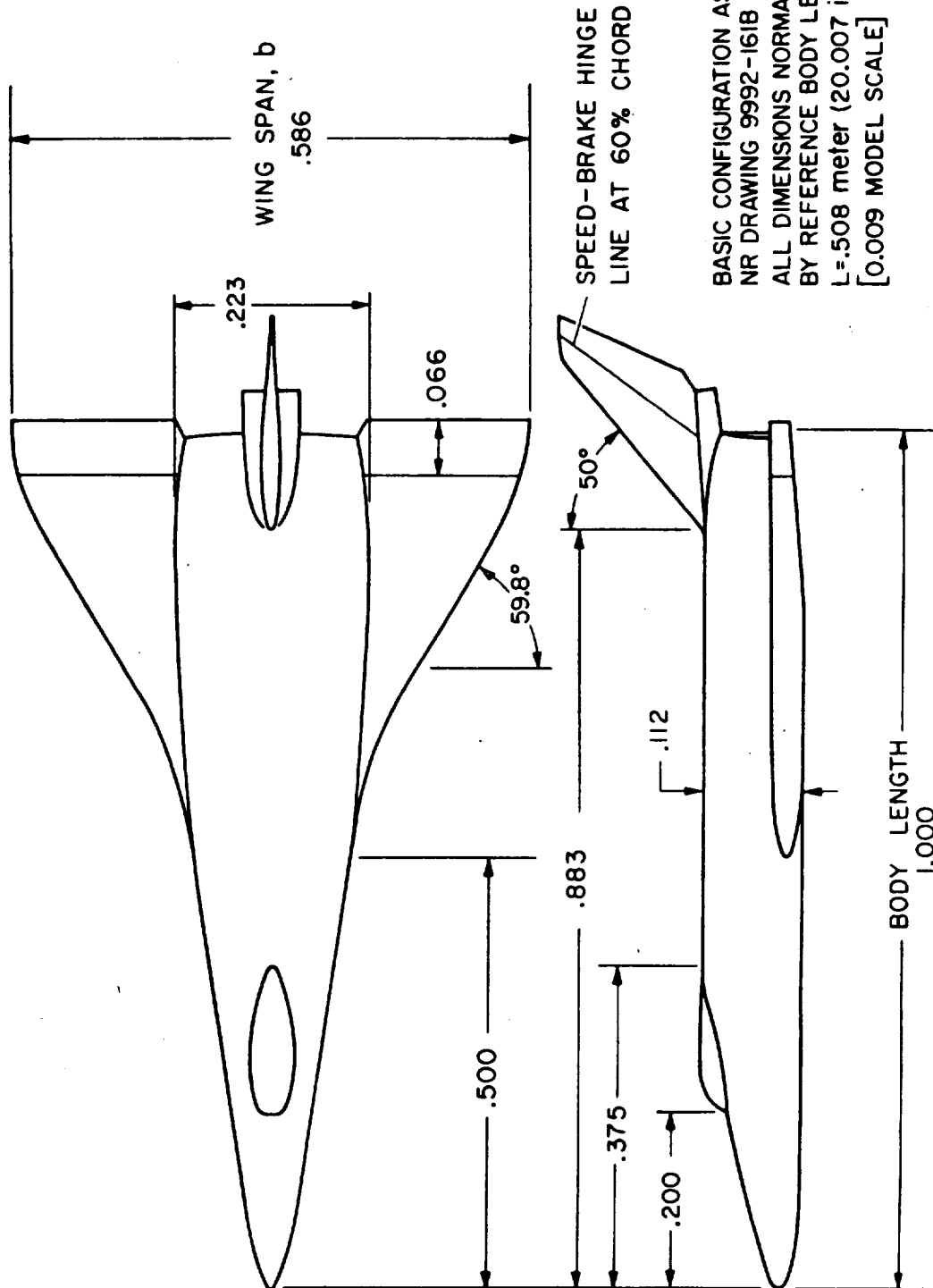
TABLE IV
RUN SCHEDULE
(TEST 131 RUNS 1-32)
 $M_\infty = 7.4$

RUN	α , deg	δ_e , deg	δ_{sb} , deg	$Re_\infty L$ (a)	P_t , atm (b)	T_t , °K
THERMOCOUPLE SCHEDULE A						
1	10	0	0	2.33×10^6	18.5	731
2	↓	↓	↓	12.41	112.7	791
3	15	↓	↓	2.04	17.8	772
4	↓	↓	↓	12.20	114.1	805
5	20	↓	↓	2.07	17.8	764
6	↓	↓	↓	7.84	69.0	776
7	↓	↓	↓	12.73	113.7	783
18	25	↓	↓	1.84	17.8	819
19	↓	↓	↓	7.50	69.1	798
20	↓	↓	↓	10.41	87.1	754
21	↓	↓	↓	12.88	111.2	768
8	30	↓	↓	2.13	17.6	748
9	↓	↓	↓	7.74	69.0	782
10	↓	↓	↓	10.03	86.6	767
11	↓	↓	↓	12.62	113.6	787
12	35	↓	↓	2.10	18.7	780
13	↓	↓	↓	9.84	86.7	777
14	↓	↓	↓	13.65	113.1	748
15	50	↓	↓	2.32	18.7	736
16	↓	↓	↓	8.42	70.0	749
17	↓	↓	↓	13.37	112.3	755
THERMOCOUPLE SCHEDULE B						
22	25	0	0	1.93×10^6	18.2	808
23	↓	↓	↓	11.83	113.2	816
30	20	10	35	2.28	18.5	739
31	↓	↓	↓	7.67	70.3	795
32	↓	↓	↓	10.87	113.9	860
24	25	↓	↓	2.00	18.5	799
25	↓	↓	↓	7.44	69.9	807
26	↓	↓	↓	12.56	112.0	782
27	30	↓	↓	1.98	18.8	811
28	↓	↓	↓	7.83	70.1	784
29	↓	↓	↓	12.28	112.1	793

^aL = 0.508 m (20.0 in.)

0.009 Model Scale

^b1 atmosphere = $1.013 \times 10^5 \text{ N/m}^2$ (14.7 psia)

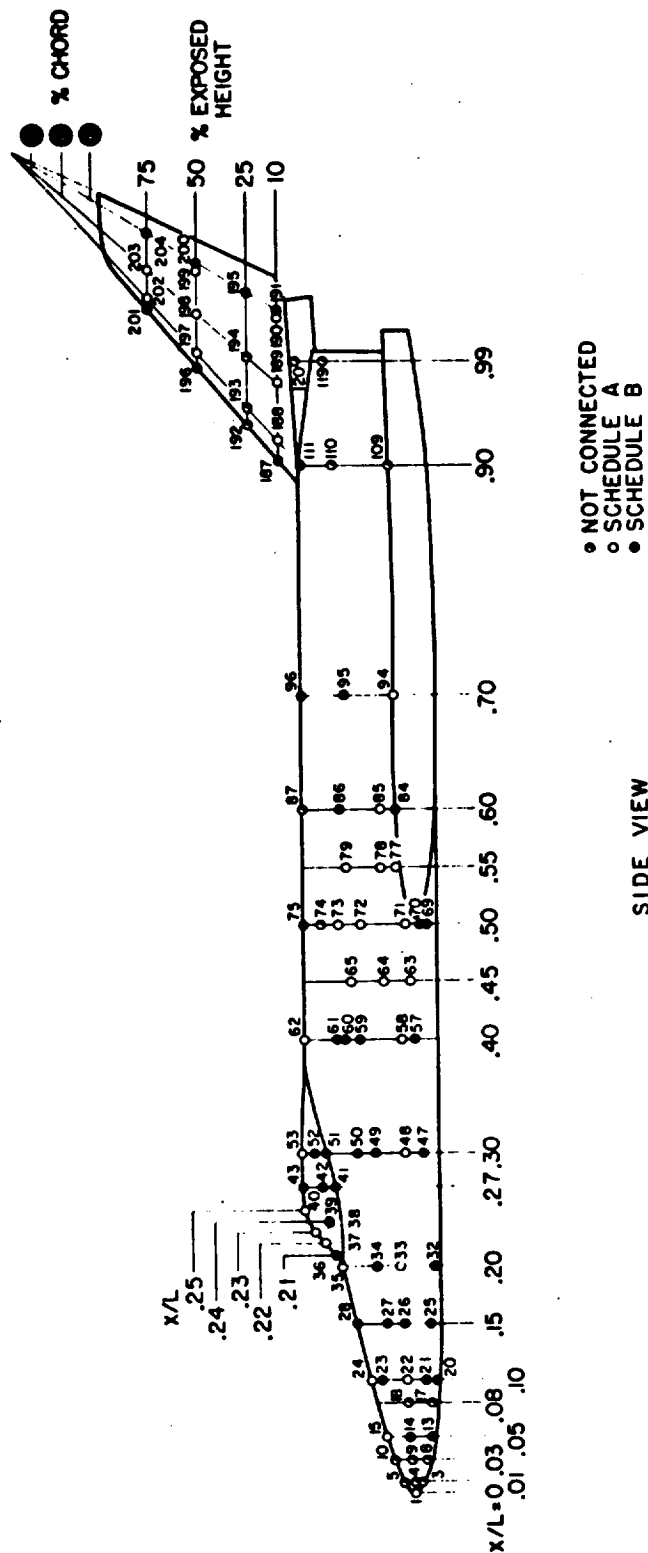


DELTA WING ORBITER
NR
DR#1252 B-3- 65

Figure 2.- Dimensioned drawing of delta-wing orbiter model.

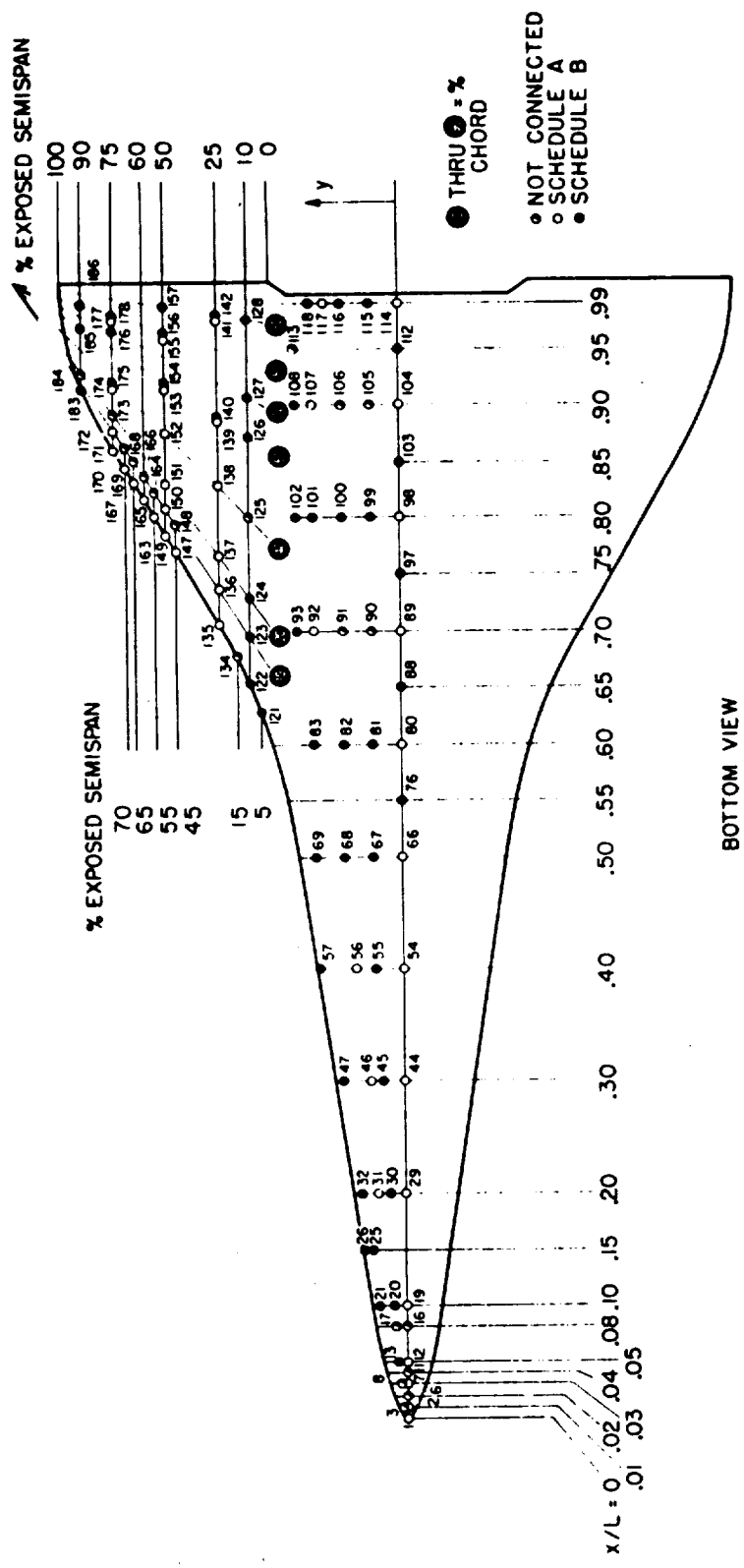
DELTA WING ORBITER
NR
DR#1252 B-3- 66

ORIGINAL PAGE IS
OF POOR QUALITY



(a) Side view.

Figure 3.- Thermocouple locations for delta-wing orbiter model.

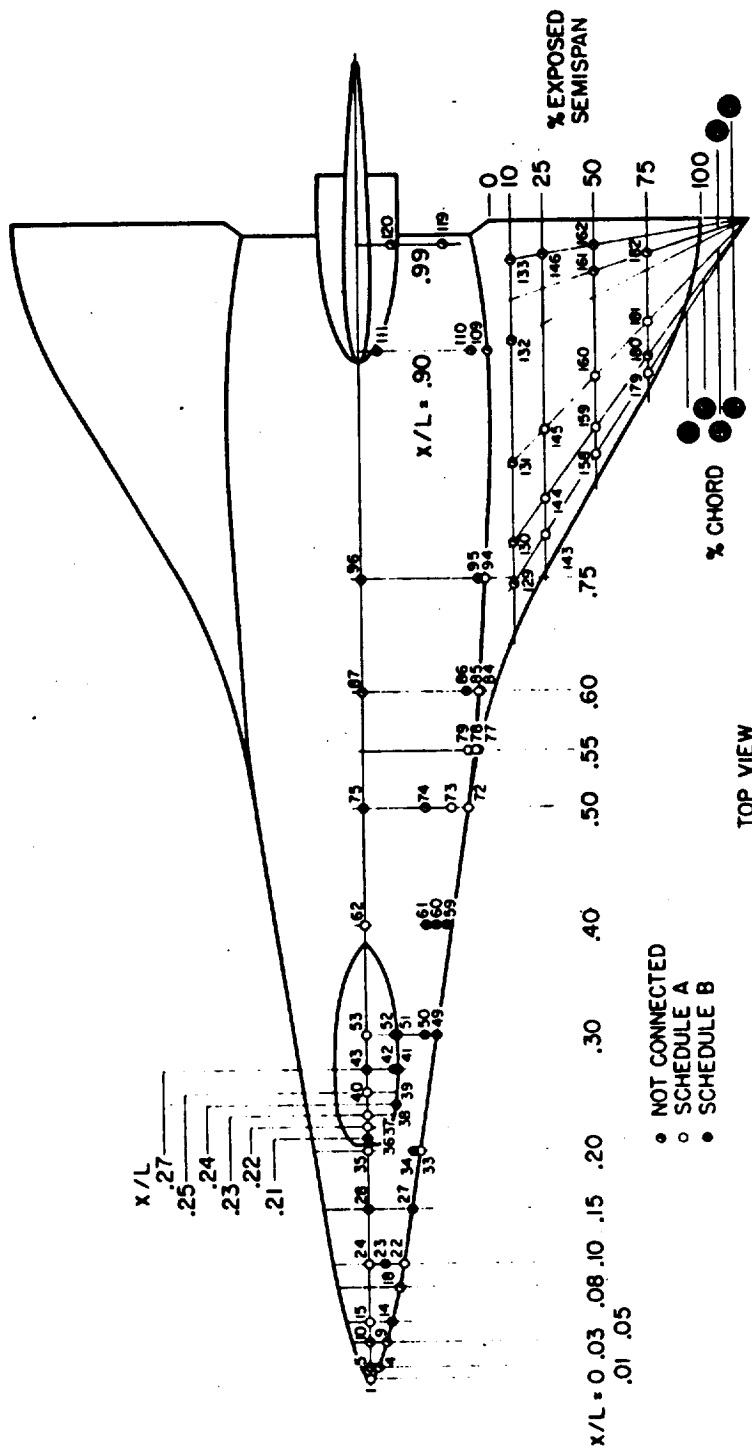


(b) Bottom view.

Figure 3.- Continued.

ORIGINAL PAGE IS
OF POOR QUALITY

ORIGINAL PAGE IS
OF POOR QUALITY



(c) Top view.

Figure 3.- Continued.

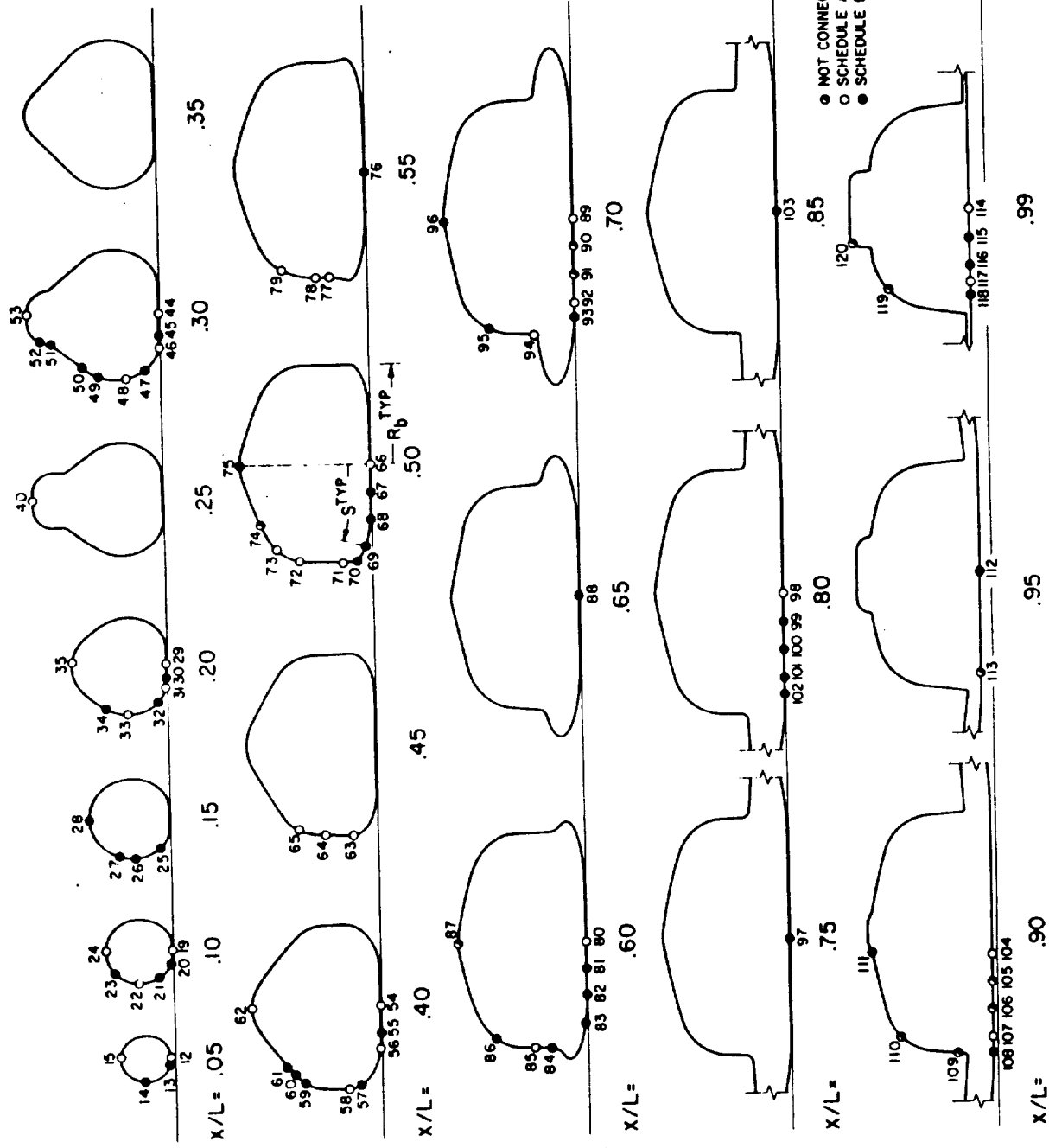


TABLE VI.
DATA-SET RUN COLLATION
TEST 106 STRAIGHT-WING ORBITER
 $M_\infty = 7.4$

(a) BASIC DATA SET 01
 $\beta = 0^\circ \delta_h = 0^\circ$

$Re_{\infty,L}$ $\times 10^{-6}$ α , deg	NOMINAL																						
	.7		1		2		3		3.5		4		6		7								
	ACTUAL																						
.64	.76	1.01	1.02	1.03	1.05	2.06	2.93	3.20	3.42	3.58	3.77	4.12	4.14	4.19	4.31	6.04	6.35	6.45	6.83	6.88	7.14	7.56	
51 ^a										53													
0	50								52														
15				28										29			30					61	
20		47											48					49		62			
25																			63				
30					31		32					33				34					64		
40											65												
60			35			37		36							38								

^a Run No.

TABLE VI. — Concluded
DATA-SET RUN COLLATION
TEST 106 STRAIGHT-WING ORBITER
 $M_{\infty} = 7.4$

(b) BASIC DATA SET 02
 $\beta = -5^\circ$ $\delta_h = 0^\circ$

$Re_{\infty} L$ $\times 10^{-6}$	NOMINAL			
	1		4	
	ACTUAL			
	1.11	1.20	3.82	4.09
α , deg				
15	45 ^a			46
30		43	44	

^a Run No.

(c) BASIC DATA SET 03
 $\alpha = 60^\circ$ $\delta_h = -50^\circ$

$Re_{\infty} L$ $\times 10^{-6}$ β , deg	NOMINAL			
	1		4	
	ACTUAL			
	.95	.98	4.14	4.15
0		39		40
-5	41		42	

1050

STRAIGHT WING ORBITER
NR
DR#1131 B-3-71

ORIGINAL PAGE IS
OF POOR QUALITY

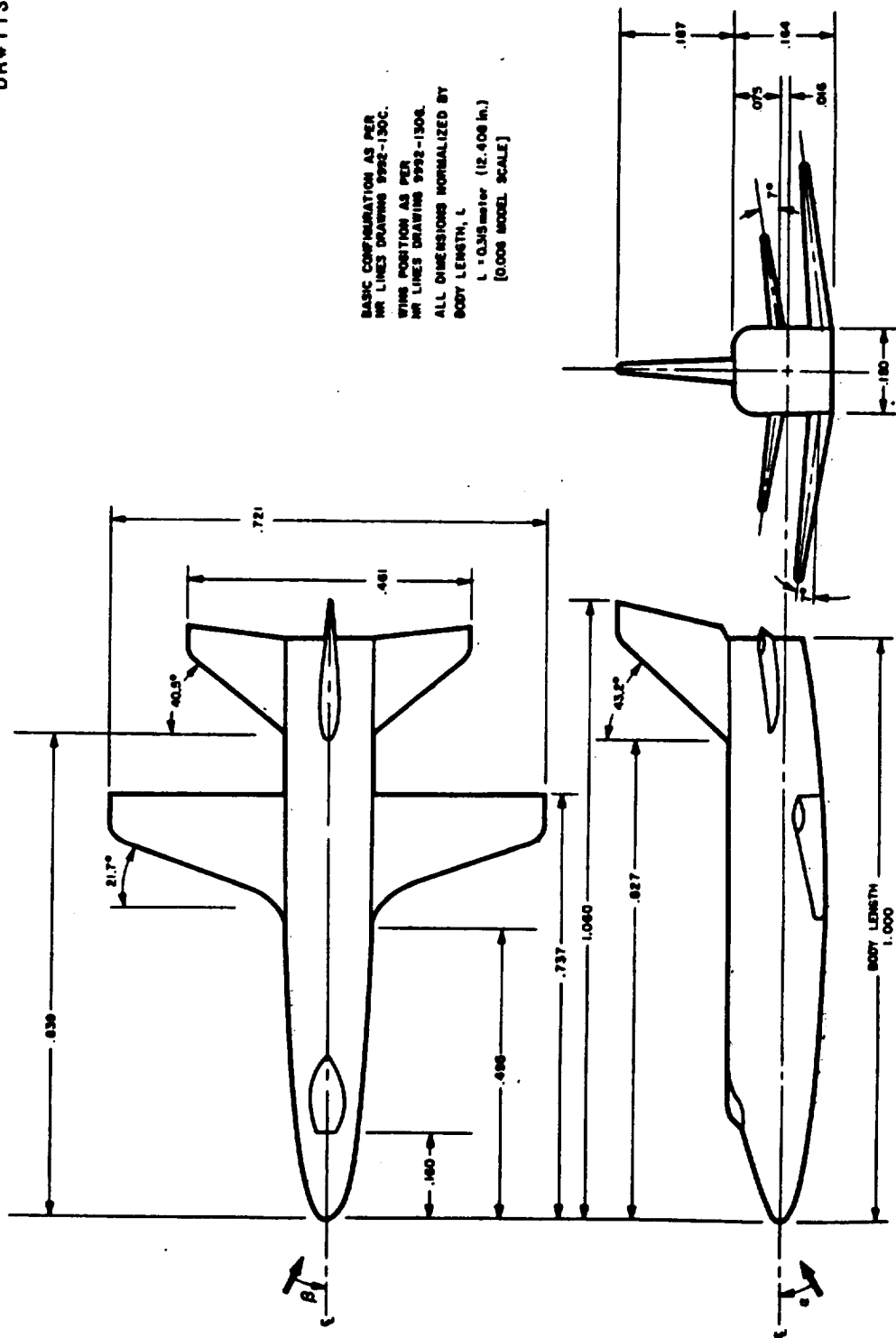
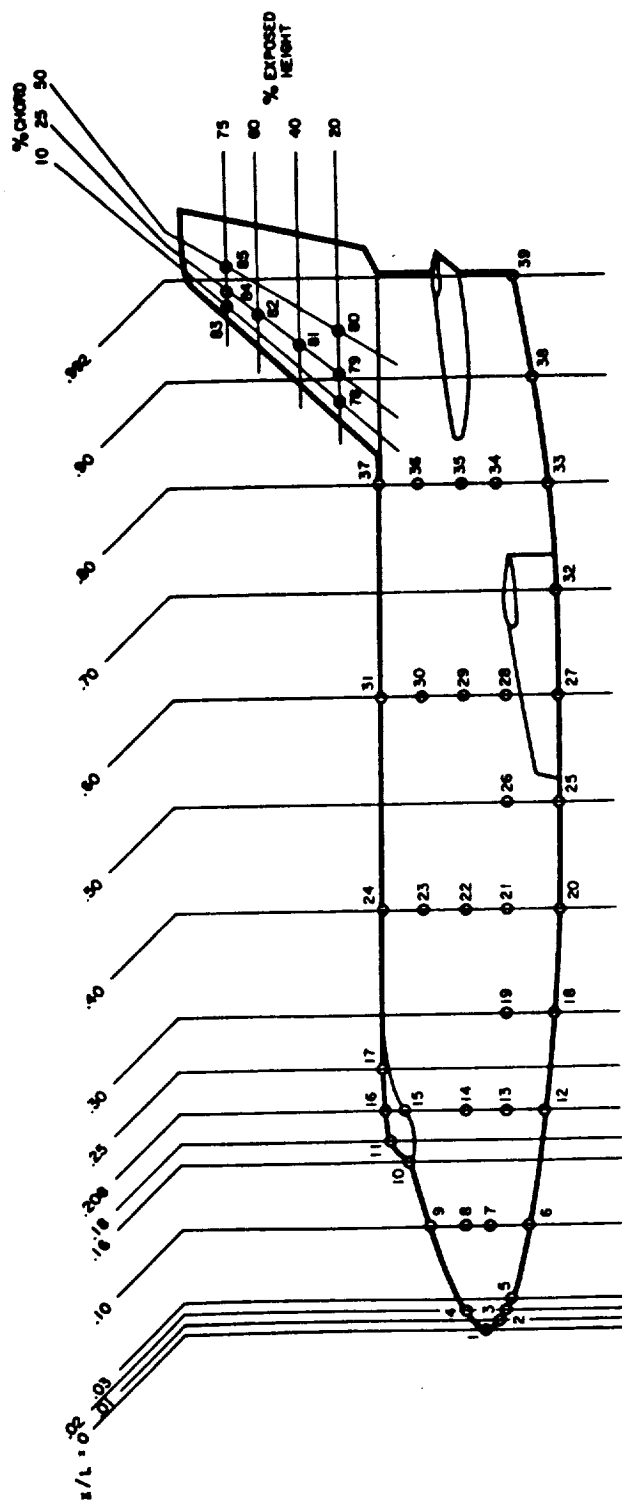


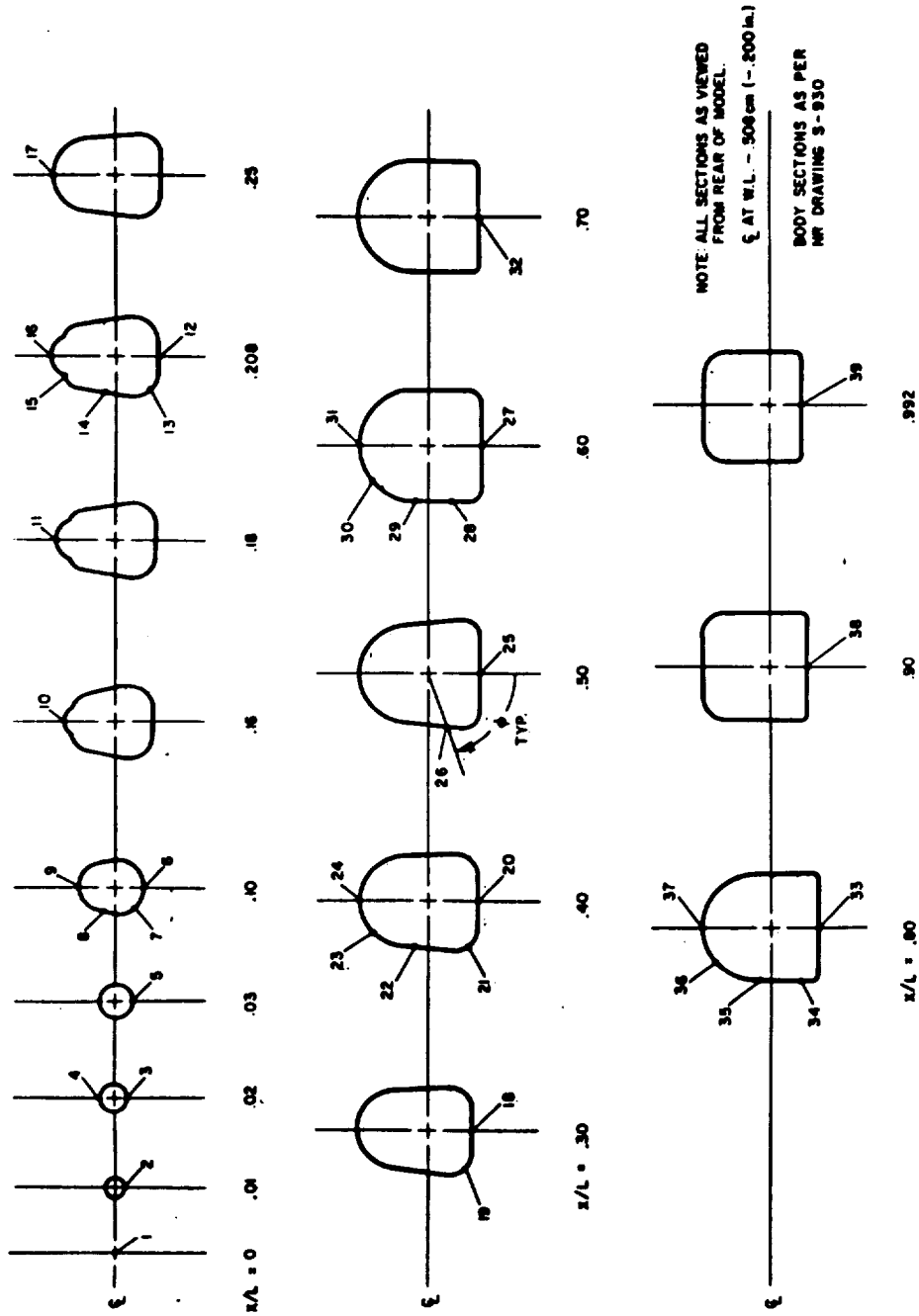
Figure II.- Three-view drawing of straight-wing orbiter model with flow orientation.



(a) Body and vertical tail.

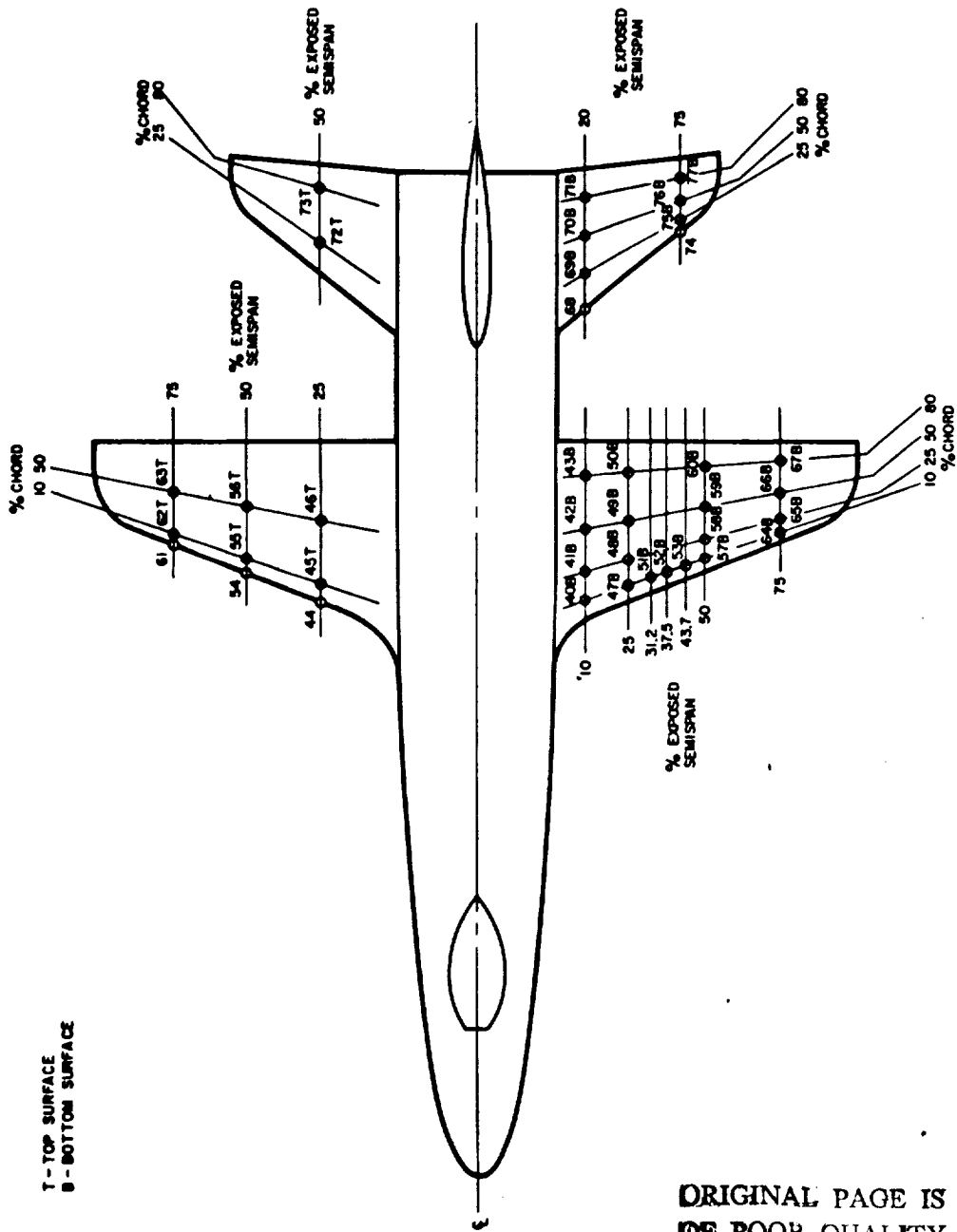
Figure III.- Thermocouple locations for straight-wing orbiter model.

STRAIGHT WING ORBITER
NR
DR#1131 B-3-73



(b) . Body cross sections.

Figure III.- Continued.



ORIGINAL PAGE IS
OF POOR QUALITY

(c) Wing and horizontal tail.

STRAIGHT WING ORBITER
NR
DR#1131 B-3-75

Figure III.- Concluded.